PB82-900109

GOVERNMENT REPORTS

Announcements & Index

9 April 23, 1982

U.S. Department of Commerce
National Technical
Information Service

NTIS

GOVERNMENT REPORTS

Announcements & Index

Published every two weeks by the National Technical Information Service (NTIS).
Annual subscription rates:

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ISSN 0097-9007

U.S. DEPARTMENT OF COMMERCE Malcolm Baldrige, Secretary of Commerce
NATIONAL TECHNICAL INFORMATION SERVICE

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GOVERNMENT REPORTS

Announcements & Index

Volume 82, Number 9 April 23, 1982

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* Committee on Scientific and Technical Information

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SAMPLE ENTRY

Field 12—MATHEMATICAL SCIENCES
Group 12A—Mathematics and Statistics
PB80-104045 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm,
E. Kausel, and G. Bouckovalas. Aug 79, 49p
R79-12, NSF/RA-79-12, NSF/RA-790206
Grant NSF-ENV77-18339

An efficient numerical procedure is presented for the computation of Hankel Transforms. The algorithm is based on the expression of the Hankel Transform in terms of a two-dimensional Fourier Transform, which is then reduced to only one dimension. The latter is then evaluated with the Fast Fourier Transform algorithm. Examples are presented, and a listing of the computer program included.

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NTIS Subcategory
NTIS order number Availability/Price codes
Corporate or Performing Organization

Report title

Personal authors Report date Page count
Report number(s)
Contract or grant number(s)

Abstract

1. AERONAUTICS

1A. Aerodynamics

AD-A108 922/6 PC **A03**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
High Speed Aerodynamic Characteristics of the GAF0PH Aerofoil.
Aerodynamics note,
B. D. Fairlie. Sep 80, 49p Rept no. ARL/AERO NOTE-398

Transonic wind tunnel tests are reported on a two-dimensional model of the GAF0PH aerofoil. The tests covered Mach numbers in the range 0.5 to 0.85 and angles of incidence from -3 deg to above maximum life coefficient. Tests were conducted both with natural transition and with transition artificially fixed. Maximum lift coefficient was found to lie just below 0.8 for most of the Mach number range and was followed by a fairly gentle stall. Drag rise Mach number was found to lie between 0.75 and 0.76 for lift coefficients up to 0.4. A leading edge separation bubble was found on the upper surface of the aerofoil for angles of incidence greater than 2-1/2 deg. (Author)

AD-A108 923/4 PC **A03**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
Aircraft Measurements of the Frequency of Turbulence Encounters in Australia, A Review and Assessment.
Structures note,
Douglas J. Sherman. Mar 81, 35p Rept no. ARL/STRUC NOTE-471

All available aircraft V-g-h measurements of turbulence encounters during routine flying in Australia have been summarised on a common basis. The data are insufficient to determine the Australian gust environment although they are not incompatible with the Royal Aeronautical Society data item ESDU 69023. There are, however, indications that at high altitudes (30,000 ft and above) gusts are encountered more frequently than the data item predicts. This is particularly so for the stronger gusts. (Author)

AD-A108 978/8 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
Additional Results of a Study of Unsteady Airfoil Surface Pressures and Turbulent Boundary Layers.
Annual rept. 1 Sep 80-31 Aug 81,
Eugene E. Covert, and Peter F. Lorber. Nov 81, 39p
TR-212, AFOSR-TR-81-0848
Grant AFOSR-80-0282

Unsteady pressure coefficients measured on an N.A.C.A. 0012 airfoil at geometric angles of attack of 0 and 10 degrees, Reynolds numbers of 700,000 and 1,000,000 and in the reduced frequency range of 0.5 to 6.4 (based upon the half chord) are presented. For simplicity the data are represented in terms of mean and unsteady pressure coefficients, which has both a magnitude and a phase. Primary conclusions are: (1) The difference pressures approach zero at the trailing edge. This corresponds to satisfying one statement of the Kutta condition. (2) Superposition of the unsteady processes in the steady flow seems accurate and valid up to reduced frequencies of 2. (3) For this airfoil with 16 deg trailing edge angle the effects of viscosity seem to be most prominent in the last 10 percent of the airfoil where the phase lags are much larger than those predicted by the linear theory. (Author)

AD-A108 987/9 PC **A04**/MF **A01**
Purdue Univ., Lafayette, IN. School of Aeronautics and Astronautics.
Flutter and Time Response Analyses of Three Degree of Freedom Airfoils in Transonic Flow.
Final rept. Nov 79-Dec 80,
T. Y. Yang, and C. H. Chen. Aug 81, 60p AFWAL-TR-81-3103
Grant AFOSR-78-3523

Flutter and time response analyses are performed for a NACA 64A006 conventional and a MBB A-3 supercritical airfoil, both oscillating with plunge, pitch, and aileron pitch d.o.f.'s in small disturbance, transonic flow. The aerodynamic coefficients are calculated using the transonic code LTRAN2-NLR. The effects of various kinds of aeroelastic parameters on flutter speeds for the bending-torsion, bending-aileron, and torsion-aileron branches are studied. The flutter speeds associated with the bending-torsion branch are plotted against Mach number for different parameter values. The flutter speed, the amplitude ratio, and the phase difference at different Mach numbers are plotted against the mass ratio for both of two d.o.f. and a three d.o.f. case. Time-response results are obtained for the NACA 64A006 and the MBB A-3 airfoils at M = 0.85 and 0.765, respectively. Using the same sets of parameter values, the flight speeds used to obtain all the neutrally stable response are very close to the flutter speeds obtained in the flutter analysis. The principle of linear superposition of airloads is used in the flutter analysis but not in the response analysis. (Author)

AD-A109 394/7 PC **A05**/MF **A01**
Nielsen Engineering and Research, Inc., Mountain View, CA.
The Influence of Sting and Strut Supports on the Aerodynamic Loads on an Ogive Cylinder at High Angles of Attack at Transonic Speeds.
Final rept. Mar 79-Sep 80,
Tom N. Canning, and Jack N. Nielsen. Oct 80, 88p
NEAR-TR-229, AFATL-TR-80-118
Contract F08635-79-C-0119

The influence of the model support system on an ogive cylinder at high angles of attack has been determined in transonic tests. Stings of varying diameter and struts in various orientations were studied. The stings did not alter the development of large side loads resulting from asymmetric vortex separation and had only moderate progressive effects on in-plane forces and moments. Struts supporting the model through its leeward meridian seriously altered normal and side forces and sharply reduced base drag at several combinations of Mach number and angle of attack. A strut supporting the model at its windward meridian (near the base) yielded results like those for the stings. (Author)

N82-14050/0 PC **A04**/MF **A01**
Goettingen Univ. (Germany, F.R.). Inst. fuer Theoretische Stroemungsmechanik.
Computation of Subsonic Flow around Airfoil Systems with Multiple Separation.
K. Jacob. 1981, 63p DFVLR-FB-81-24
Text in German.

A numerical method for computing the subsonic flow around multielement airfoil systems was developed, allowing for flow separation at one or more elements. Besides multiple rear separation, short bubbles on the upper surface and cove bubbles are taken into account. Compressibility effects for pure subsonic flow are approximately accounted for.

N82-14055/9 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Comparison of Experimental and Theoretical Turbulence Reduction Characteristics for Screens, Honeycomb, and Honeycomb-Screen Combinations.
J. Scheiman. Dec 81, 55p NASA-TP-1958, L-14628

Turbulence reduction research using screens, honeycomb, and combinations thereof was conducted in a half-scale model of a portion of the Langley 8-foot transonic pressure tunnel. It was found that screens alone reduce axial turbulence more than lateral turbulence; whereas, honeycomb alone reduces lateral turbulence more than axial turbulence. Because of this difference, the physical mechanism for decreasing turbulence for screens and honeycomb must be completely different. It is concluded that honeycomb with a downstream screen is an excellent combination for reducing turbulences.

N82-14057/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Experimental Investigation of a Transonic Potential Flow around a Symmetric Airfoil.
W. J. Hiller, and G. E. A. Meier. Dec 81, 26p NASA-TM-76676, REPT-10/1971
Contract NASW-3541
Transl. Into English from Rept. 10/1971 Max-Planck Inst. Fuer Stroemungsforschung, Goettingen, W. Germany, Nov. 1971 22 p. Original Language Document Was Announced as N72-19996. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

Experimental flow investigations on smooth airfoils were done using numerical solutions for transonic airfoil streaming with shockless supersonic range. The experimental flow reproduced essential sections of the theoretically computed frictionless solution. Agreement is better in the expansion part of the of the flow than in the compression part. The flow was nearly stationary in the entire velocity range investigated.

N82-14059/1 PC **A06**/MF **A01**
Low Energy Transport Systems, Capistrano Beach, CA.
Low Reynolds Number Airfoil Survey, Volume 1.
Final Report.
B. H. Carmichael. Nov 81, 106p NASA-CR-165803-V-1
NASA ORDER L-4059B

The differences in flow behavior two dimensional airfoils in the critical chordlength Reynolds number compared with lower and higher Reynolds number are discussed. The large laminar separation bubble is discussed in view of its important influence on critical Reynolds number airfoil behavior. The shortcomings of application of theoretical boundary layer computations which are successful at higher Reynolds numbers to the critical regime are discussed. The large variation in experimental aerodynamic characteristic measurement due to small changes in ambient turbulence, vibration, and sound level is illustrated. The difficulties in obtaining accurate detailed measurements in free flight and dramatic performance improvements at critical Reynolds number, achieved with various types of boundary layer tripping devices are discussed.

N82-14069/0 PC **A06**/MF **A01**
European Space Agency, Paris (France).
Hypersonic Slip-Flow around Siender Elliptical Cones at a Slight Angle of Attack.
Ph.D. Thesis - Rheinisch-Westfaelischen Technischen Hochsule, West Germany.
P. Evangelou. Sep 81, 122p ESA-TT-644, DFVLR-FB-7921
Transl. Into English of "Hypersonische Gleitstroemung Um Schwach Angestellte Schlanke Elliptische Kegel", Dfvlr-FB-79-21 Dfvlr, Goettingen, (Germany, F.R.), May 1979. Original Report in German Previously Announced as N80-25301.

A method is developed for calculating the hypersonic slip flow around elliptical cones at low angles of incidence. Using orders of magnitude a system of partial nonlinear differential equations of second order and parabolic character is derived from the Navier-Stokes equations and the energy equation; this system describes the flow in the shock formation region. The system of differential equations is integrated using an explicit finite difference procedure. The results obtained are compared with test results and the results of other theoretical flow field investigations. The influence of the axis ratio of the elliptical cone section and of the angle of incidence on the development of the flow field in the shock formation region is investigated. For small angles of incidence, to an elliptical cone, the cross flow appears only slowly, or not at all, whereas at moderate incidences, because of the large expansion, a marked cross flow occurs around the ridge line. This expansion and cross flow become more marked with increasing ellipticity of the conical section and with increasing incidence.

N82-14070/8 PC **A05**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Goettingen (Germany, F.R.).
Time Linearized Calculation of Two Dimensional Unsteady Transonic Potential Flow at Small Disturbances.
R. Voss. Oct 80, 88p DFVLR-FB-81-01
In German; English Summary. Report Will Also Be Announced as Translation (Esa-TT-728).

An integral equation method for calculating unsteady transonic flow fields around oscillating airfoils at small disturbances was investigated. The procedure is based on separating the velocity potential into steady and unsteady parts and linearizing the resulting unsteady differential equation under the assumption of harmonic oscillations of small amplitudes. Use of Green's theorem results in two coupled integral equations for a doublet distribution at the profile and a source distribution in the whole flow field. Neglecting far field influences, the equations are discretized in a finite area and solved by iteration. The influences of discretization and limitation of the field are shown by results for a NACA 64A 006 profile.

N82-14388/4 PC **A05**/MF **A01**
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
La Recherche Aerospatiale, Bi-Monthly Bulletin No. 1981-2, March - April 1981.
C. Sevestre. Sep 81, 77p ESA-TT-713
Transl. Into English of la Rech. Aerospatiale, Bull. Bimensuel (Paris) No. 1981-2, Mar. - Apr. 1981.

No abstract available.

N82-14958/4 PC **A11**/MF **A01**
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
Aerospace Research Activities.
Annual Report, 1980.
1981, 238p

The activities of the ONERA in 1980 are reported. Research is reported in: fluid mechanics; aerodynamics; wind tunnel tests; structural design; engine design; measurement techniques; light alloys and composites; integrated systems; and control techniques.

PB82-151531 PC **A06**/MF **A01**
Midwest Research Inst., Raleigh, NC.
Source Category Survey: Animal Feed Dryers.
Final rept.
Dec 81, 112p EPA-450/3-81-017
Contract EPA-68-02-3059

This report presents the findings of a study to assess the need for new source performance standards (NSPS) for animal feed dryers. Industries which use animal feed dryers are included in SIC 2046: Wet Corn Milling; SIC 2047: Dog, Cat, and Other Pet Food; SIC 2048: Prepared Feeds and Feed Ingredients for Animals and Fowls; SIC 2063: Beet Sugar; SIC 2075: Soybean Oil Mills; SIC 2077: Animal and Marine Fats and Oils; SIC 2082: Malt Beverages; and SIC 2085: Distilled, Rectified, and Blended Liquors. Information and estimates concerning production, growth, industry structure, and emissions are presented. Animal feed dryers are sources of particulate matter emissions at plants where they are used. Methods of air pollution control and their effectiveness are examined. Summary of State regulations applicable to dryers is given. An estimate of total emission reduction achievable through an NSPS is given.

1B. Aeronautics

AD-A108 801/2 PC **A03**/MF **A01**
Canyon Research Group, Inc., Westlake Village, CA.
Descent-Rate Cuing for Carrier Landings: Effects of Display Gain, Display Noise and Aircraft Type.
Interim rept. 1 May 80-30 Nov 81,
Gavan Lintern, Charles E. Kaul, and Daniel J. Sheppard. Oct 81, 42p TR-81-015, NAVTRAEQ-78-C-0060-8
Contract N61339-78-C-0060

Two studies are reported concerning the utility of modifying a conventional Fresnel Lens Optical Landing System (FLOLS) to include variable-length vertical light arrays, or arrows, in order to provide descent-rate information to pilots making carrier landings. In the first study, the Descent-Rate Cuing (DRC) algorithm incorporated an angular gain to provide glideslope displacement information. The DRC system did not significantly improve glideslope tracking performance. Lineup performance was not adversely affected. The effects of aircraft type and noise on the DRC were also examined. In the second study, the DRC algorithm incorporated a modified linear gain to provide glideslope displacement information. The DRC system consistently reduced glideslope error throughout the approach. Comparison of the data and previous research suggests that a DRC system incorporating a linear gain can produce a strong and consistent improvement in glideslope control in carrier landings. (Author)

AD-A108 877/2 PC **A06**/MF **A01**
Systems Control Technology, Inc., West Palm Beach, FL.
Weather Deterioration Models Applied to Alternate Airport Criteria.
Final rept.,
Edwin D. McConkey. Sep 81, 103p FAA/RD-81/92
Contract DOT-FA79NA-6029

Flights under Instrument Flight Rules (IFR) require the filing of a flight plan. The flight plan must contain an alternate airport unless certain conditions at the destination are met. These conditions concern the availability of an instrument approach procedure and anticipated meteorological conditions within one hour of the estimated arrival time. Certain other conditions must be met for an airport to qualify as an alternate airport. These conditions also are based on instrument approach procedure availability and forecast meteorological conditions. Relaxation of the current requirements regarding alternate airports could benefit some aircraft operators by improving schedule reliability and reducing the number of weather related departure delays. The investigation quantified the increased risk of ceilings and visibilities being below landing minimums at several cities in the conterminus U.S. if requirements are relaxed. The study methods utilized climatology data and weather deterioration models to calculate the probability of an airport being below precision and non-precision approach minimums. (Author)

AD-A108 878/0 PC **A04**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Analysis of a Nonlinear Altitude Tracking Method.
Final rept. Sep-Dec 80,
Barry R. Billmann. Nov 81, 57p FAA-CT-81/15, FAA/RD-81/60

This report analyzes the performance of the nonlinear altitude tracker developed for the Active Beacon Collision Avoidance System (BCAS) by Lincoln Laboratory. The tracker is intended for use in the collision avoidance logic of the BCAS system. The nonlinear tracker performance was characterized through comparisons with the previous altitude tracker. The original tracker, used by the collision avoidance logic, was a simplistic alpha-beta tracker. The nonlinear tracker performance evaluation was conducted in three phases: (1) The stand-alone error characteristics of the tracker were obtained. Simulated mode C report sequences were provided directly to the tracker. (2) The nonlinear tracker was integrated directly into the collision avoidance logic. With the use of the Fast-Time Encounter Generator (FTEG), a comparative study of performance with the nonlinear tracker versus the alpha-beta tracker was made. (3) Selected live flight test encounters were used to analyze the relative performance of the alpha-beta tracker versus the nonlinear tracker. The stand-alone analysis revealed that the nonlinear tracker consistently had smaller maximal errors in vertical rate estimation and a smaller transient rate response delay than did the alpha-beta tracker. Both the live flight test encounter simulations and the FTEG scenario simulation indicated that nonlinear tracking often caused an increase in separation for encounters with vertically accelerating threats and reduced occurrences of incorrect command sense choice. (Author)

AD-A109 177/6 PC **A03**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Solid State Instrument Landing System, Runway 35 AN/GRN-27. Initial Evaluation Report, Carswell AFB, Texas, 19-27 August 1981.
Final rept.,
Wayne E. Bowser, and Darrell W. Miller. 23 Oct 81, 47p Rept no. 81/66N-284

This report presents the results of the 19-27 August 1981 Initial TRACALS Evaluation of the Carswell AFB Runway 35 AN/GRN-27 SSILS. The evaluation was conducted to determine the capabilities and limitations of the system in its installed environment. Results presented in this report can be used as a guide for anticipated performance until there is a significant change in ground equipment, siting environment, screening or operational use. (Author)

AD-A109 289/9 PC **A09**/MF **A01**
Federal Aviation Administration, Washington, DC. Office of Management Systems.
FAA Statistical Handbook of Aviation, Calendar Year 1980.
Annual rept.
31 Dec 80, 183p

This report presents statistical information pertaining to the Federal Aviation Administration, The National Airspace System, Airports, Airport Activity, U.S. Civil Air Carrier Fleet, U.S. Civil Air Carrier Operating Data, Airmen, General Aviation Aircraft, Aircraft Accidents, and a Glossary of the terms used in this publication. (Author)

N82-14084/9 PC **A02**/MF **A01**
National Aerospace Lab., Amsterdam (Netherlands).
A Method for Measuring Takeoff and Landing Performance of Aircraft, Using an Inertial Sensing System.
A. Pool, J. L. Simons, G. J. H. Wensink, and A. J. L. Willekens. 25 Sep 80, 10p NLR-MP-80036-U
Presented at AGARD Flight Mech. Panel Symp. On Subsystem Testing and Flight Test Instrumentation, Geilo, Norway, 27-30 Oct. 1980.

An inertial sensing system, STALINS, used to provide trajectory data for takeoff and landing measurement instrument design, is presented. The system specifications based on certification requirements for civil transport aircraft are defined for continuous and rejected takeoff, minimum unstick speed, minimum control speed on the ground, and landing. Calculations are performed using a computer program supplemented by a manual check, giving horizontal distance and height measurements. Data are made available within 24 hours. The method is accurate and is suitable for tests at several airfields, since instrumentation is either onboard already, or easily transported by the aircraft.

N82-14101/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Mls Vertical Guidance and Navigation for a STOL Airplane Landing on an Elevated Stolport.
D. N. Warner, Jr. Nov 81, 27p NASA-TM-81338

In contrast to CTOL landing operations, STOL airplanes landing on short STOLport runways typically begin the flare maneuver before reaching the runway surface. Vertical guidance procedures were developed to allow an autoland flight control system for a STOL airplane to use Microwave Landing System (MLS) signals as altitude and sink rate references for flare initiation, with a transition to radar altimeter after the airplane is over the runway. The implementation has minimum impact on the control system and landing performance. Data are presented which show validation of the concepts in a simulator.

PB82-134339 PC **A05**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, 1979.
16 Nov 81, 87p NTSB-ARC-81-1

The publication presents the record of aviation accidents in all operations of the U.S. air carriers for calendar year 1979. It includes an analysis by class of carrier and type of service in which the 1979 performances are compared with 5-year base-period averages. A 10-year review, 1970 through 1979, of the certificated route carriers is presented for accident rates by aircraft make and model, types of accidents, phases of operation, causes or related factors, and a comparison of total which summarize the accidents, fatalities, and accident rates; causal tables; and briefs of accidents are presented in the appendixes.

PB82-138892 PC **A09**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Listing of Aircraft Accidents/Incidents by Make and Model, U.S. Civil Aviation, 1979.
16 Oct 81, 188p NTSB-AMM-81-1

The publication contains a listing of all U.S. civil aviation accidents/incidents occurring in calendar year 1979, sorted by aircraft make and model. Included are the file number, aircraft registration number, date and location of the accident, aircraft make and model and injury index for all 4,182 accidents/incidents occurring in this period.

PB82-138900 PC **A04**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Midair Collisions: U.S. General Aviation 1979.
16 Oct 81, 54p NTSB-AMM-81-2

The publication contains reports of U.S. general aviation accidents involving midair collisions that occurred in 1979. Included are 25 accident files, 14 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by kind of flying, phase of operation, injury index, altitude of occurrence, airport proximity, aircraft damage, pilot certificate, injuries and causal factor(s). This publication will be published annually.

PB82-138918 PC **A06**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Turbine Powered Aircraft, U.S. General Aviation, 1979.
16 Oct 81, 110p NTSB-AMM-81-3

The publication contains reports of U.S. general aviation turbine powered aircraft accidents occurring in 1979. Included are 171 accident Briefs, 36 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and cause/factor(s).

PB82-138926 PC **A08**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Rotorcraft, U.S. General Aviation, 1979.
16 Oct 81, 166p NTSB-AMM-81-4

The publication contains reports of U.S. general aviation rotorcraft accidents occurring in 1979. Included are 289 accident Briefs, 39 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, kind of flying, pilot certificates, injuries, and causes and related factors.

PB82-138934 PC **A12**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Fatal Accidents Involving Weather as a Cause/Factor, U.S. General Aviation, 1979.
16 Oct 81, 271p NTSB-AMM-81-5

The publication contains reports of all fatal U.S. general aviation accidents involving weather as a cause/factor for the year 1979. Included are 276 fatal accidents in the brief format. This format presents the facts, conditions, circumstances, and probable

cause(s) for each accident. Additional statistical information is tabulated on all accidents involving weather as a cause/factor by type of accident, phase of operation, injury index, aircarft damage, pilots certificate, injuries and cause/factor(s). This publication will be published annually.

PB82-138942 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Alcohol as a Cause/Factor, U.S. General Aviation, 1979.
16 Oct 81, 40p NTSB-AMM-81-6

The publication contains reports on all U.S. general aviation accidents, occuring in 1979, involving alcohol inpairment as a cause/factor. Included are 34 accident Briefs, 30 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal factor(s).

PB82-138959 PC **A04**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Missing and Missing Later Recovered Aircraft, U.S. General Aviation, 1979.
16 Oct 81, 72p NTSB-AMM-81-7

The publication contains reports of U.S. general aviation missing and missing later recovered accidents occurring in 1979. Included are 68 accident Briefs, 21 of which cover missing aircraft not recovered and 47 missing later recovered. The Brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal factor(s).

PB82-138967 PC **A04**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Corporate/Executive Aircraft, U.S. General Aviation, 1979.
16 Oct 81, 67p NTSB-AMM-81-8

The publication contains reports of U.S. general aviation corporate/executive aircraft accidents occurring in 1979. Included are 77 accident Briefs, 14 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injuries and causal/factor(s).

PB82-138975 PC **A05**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Amateur/Home Built Aircraft, U.S. General Aviation, 1979.
16 Oct 81, 76p NTSB-AMM-81-9

The publication contains reports of U.S. general aviation accidents involving amateur/home built aircraft occurring in 1979. Included are 130 accident Briefs, 36 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal/factor(s).

PB82-138983 PC **A12**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Aerial Application Operations, U.S. General Aviation, 1979.
16 Oct 81, 260p NTSB-AMM-81-10

This publication contains reports of U.S. general aviation aerial application accidents occurring in 1979. Included are 395 accident Briefs, 27 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries, kind of operation, and causes/factors.

PB82-138991 PC **A08**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Commuter Air Carriers and On-Demand Air Taxi Operations, U.S. General Aviation, 1979.
16 Oct 81, 168p NTSB-AMM-81-11

The publication contains reports of commuter air carrier and on-demand air taxi accidents that occurred in 1979. Included are 50 commuter air carrier and 173 on-demand air taxi accident briefs. The brief format presents the facts, conditions, circumstances and probable cause(s) for each accident. Additional statistical information is tabulated by type of operation, injuries, aircraft weight, and cause(s) and related factor(s).

PB82-139007 PC **A07**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Fatal Accidents Involving Fixed-Wing Multi-Engine Aircraft, U.S. General Aviation, 1979.
16 Oct 81, 148p NTSB-AMM-81-12

The publication contains reports of fixed-wing multi-engine general aviation aircraft accidents that occurred in 1979. Included are 15 turbojet, 51 turboprop and 444 reciprocating engine aircraft accidents. However, briefs of only the fatal accidents in the three categories are presented. The brief format presents the facts, conditions, circumstnces and probable cause(s) for each accident. Additional statistical information is tabulated by injuries and cause(s) and related factor(s).

PB82-139015 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Briefs of Accidents Involving Gliders, U.S. General Aviation, 1979.
16 Oct 81, 44p NTSB-AMM-81-13

The publication contains reports on all U.S. general aviation accidents, occurring in 1979, involving gliders. Included are 54 accident Briefs, 2 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot age, injuries and causal factor(s).

PB82-139353 PC **A08**/MF **A01**
South Carolina Div. of Transportation, Columbia.
Maximizing South Carolina's Aviation Resources: Identifying Potentially Profitable Commuter Airline Routes. Volume II,
Clinton H. Whitehurst, Jr., Mark A. McKnew, Michael W. Broadway, and Gayle H. Taylor. Oct 81, 168p EDA-81-0132
Grant EDA-04-06-03042-40
Prepared in cooperation with Clemson Univ., SC. Dept. of Industrial Management.

The study analyzes the commuter airline routes within South Carolina. This study concludes there are, in fact, a number of potentially profitable commuter airline routes between communities within South Carolina and interstate routes tying some communities in the State to medium and large hub airports. There is, however, still work to be done. As communities grow in size and should air service to the State by trunk carriers decline further, it would be well worth it for a community to reevaluate its potential to support commuter service in terms of the profitability criteria outlined in this study.

PB82-143538 PC **A05**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
The Flight Service Automation System (FSAS) System Benchmark. Volume I: Summary, Introduction and Concepts.
Technical rept.,
R. G. Nystrom, S. Koslow, and C. R. Spooner. Aug 81, 80p MTR-81W131-VOL-1
Contract DTFA01-81-C-10001
See also Volume 2, PB82-143546.

In support of the FAA procurement of the Flight Service Automation System (FSAS), MITRE has developed a new system benchmarking technology to meet the requirements of an interactive, dedicated application. This methodology is applicable to procurements in which the hardware/operating system configurations are off-the-shelf and the applications software has not yet been implemented in its eventual form. In this methodology, a model of the application is interfaced with the operating system and is executed, while being driven by a specified load, and performance of the proposed configuration is measured. This report documents the requirements of the FSAS application of this system benchmark methodology and is published in the present form to record and make available the concepts and techniques of the methodology. A previous version of this report had been invoked in the FAA's procurement process. This report consists of eight parts published in four volumes. This volume contains the Executive Summarty, Part I, Summary, Part II, Technical Introduction, and Part III, Technical Concepts, providing a brief summary for managerial prsonnel and an introduction to the concepts and to the efforts required of the vendor.

PB82-143546 PC **A15**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
The Flight Service Automation System (FSAS) System Benchmark. Volume II: The Model of the Application.
Technical rept.,
C. R. Spooner. Aug 81, 344p MTR-81W131-VOL-2
Contract DTFA01-81-C-10001
See also Volume 1, PB82-143538 and Volume 3, PB82-143553.

In support of the FAA procurement of the Flight Service Automation System (FSAS), MITRE has developed a new system benchmarking technology to meet the requirements of an interactive, dedicated application. This methodology is applicable to procurements in which the hardware/operating system configurations are off-the-shelf and the applications software has not yet been implemented in its eventual form. In this methodology, a model of the application is interfaced with the operating system and is executed, while being driven by a specified load, and performance of the proposed configuration is measured. This report documents the requirements of the FSAS application of this system benchmark methodology and is published in the present form to record and make available the concepts and techniques of the methodology. A pervious version of this report had been invoked in the FAA's procurement process. The entire report consists of eight parts, published in four volumes. This volume contains Part IV, Model. This part describes the model of the application and provides requirements and guidelines for mapping the model to the proposed configurations and for selection of options in the model.

PB82-143553 PC **A08**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
The Flight Service Automation System (FSAS) System Benchmark. Volume III: The Vendor Interface Package.
Technical rept.,
C. R. Spooner. Aug 81, 175p MTR-81W131-VOL-3
Contract DTFA01-81-C-10001
See also Volume 2, PB82-143546.

In support of the FAA procurement of the Flight Service Automation System (FSAS), MITRE has developed a new system benchmarking technology to meet the requirements of an interactive, dedicated application. This methodology is applicable to procurements in which the hardware/operating system configurations are off-the-shelf and the applications software has not yet been implemented in its eventual form. In this methodology, a model of the application is interfaced with the operating system and is executed, while being driven by a specified load, and performance of the proposed configuration is measured. This report documents the requirements of the FSAS application of this system benchmark methodology and is published in the present form to record and make available the concepts and techniques of the methodology. A previous version of this report had been invoked in the FAA's procurement process. The entire report consists of eight parts, published in four volumes. This volume contains Part V, Vendor Interface Package. The Vendor Interface Package (VIP) is prepared by the vendor and provides a standard interface for the model with the proposed system. This part presents the VIP requirements and implementation guidelines.

1C. Aircraft

AD-A108 790/7 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Wind-Tunnel Investigation of the Effects of Blade Tip Geometry on the Interaction of Torsional Loads and Performance for an Articulated Helicopter Rotor.
Technical paper,
William T. Yeager, Jr., and Wayne R. Mantay. Dec 81, 63p NASA-L-14674, NASA-TP-1926, USAAVRADCO-TR-81-B-5

An investigation was conducted in the Langley Transonic Dynamics Tunnel to determine the effects of rotor blade tip geometry on the interaction between torsional loads and performance for an articulated helicopter rotor. Tests were conducted using four tip geometries at advance ratios of 0.20, 0.30, and 0.35. Geometric variations between tips consisted to taper, sweep, and anhedral. (Author)

AD-A108 876/4 PC **A11**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Workshop on Mathematical Fire Modeling, March 24-27, 1981.
Aug 81, 227p Rept no. FAA-CT-81/209

Contents: Aircraft Fire Scenarios; FAA Modeling Efforts; DACFIR Model Workshop; Correlation Work and Flame Spread; Undsafe Code Applied to Aircraft Cabin Fire Modeling; Modeling Heat Fluxes for Aircraft; Enclosure Models Applied to Aircraft; Thermochemical Modeling of Burning Aircraft Materials; and Enclosure Fire Dynamics Model for Interior Cabin Fires.

AD-A108 924/2 PC **A03**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Transport Aircraft Cockpit Standardization (Federal Aviation Regulations Part 25).
Final rept.,
Richard Sulzer. Nov 81, 42p FAA-CT-80-54, FAA-EM-81/11

The present status of transport aircraft cockpit standardization was evaluated by examination of regulations and other design practice documents and by interviews with airline pilots and engineers. Flight critical areas most in need of increased standardization were identified as (1) primary flight guidance instrumentation and (2) pilot input keyboards. Additional areas proposed for further industry consultation, possibly leading to further standardization at a future date, include flap, slat, and leading-edge device control and display systems; indicated airspeed (IAS)-Mach indicators; powerplant instrumentation; and electric and hydraulic power diagrams, displays, and controls. The continued use of a mixed metric and English unit measurement plan in both United States and foreign manufactured aircraft is noted, and the incidence of pilot dual qualifications and the need for criteria for digital system software certification are also discussed.

AD-A109 044/8 PC **A05**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
A Review of Aircraft Cabin Conditioning for Operations in Australia,
Brian Rebbechi. Oct 80, 80p Rept no. ARL-MECH-ENG-159

A review is presented of aircraft cabin conditioning. This review has been undertaken because of the inadequate performance of many aircraft air conditioning systems in the hottest conditions encountered in Australia. The factors included in this study were the climatic conditions (both Australia and world-wide), human performance in hot conditions, the heat balance of aircraft cabins, cooling system performance, and specification of cabin environment control systems. It is concluded that climatic conditions in Australia are not severe in a world-wide context, and that there is no technological reason why the cabin conditioning systems of aircraft should be inadequate. Compliance with present RAAF specifications will provide an acceptable cabin environment for operation of aircraft in Australia. (Author)

AD-A109 048/9 PC **A02**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
Disengagement of Safety Harness Buckles -CT4.
Rept. for Aug-Dec 79,
S. R. Sarrailhe, and G. A. Thomas. Mar 81, 25p Rept no. ARL/STRUC-NOTE-469

During the crash of a CT4 Airtrainer in August, 1979 both safety harness buckles disengaged. The crash was very severe but the harnesses did not show signs of overloading. After a series of tests it was concluded that the buckles disengaged because of misalignment of the loads onto the buckle. This misalignment may not be represented in the standard test procedures and they may give a false sense of security. New tests are proposed, but further work would be desirable to establish design and test criteria. (Author)

AD-A109 049/7 PC **A03**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
Aeronautical Research Laboratories Structures Division Annual Report 1979-80,
F. H. Hooke. Apr 81, 46p Rept no. ARL/STRUC NOTE-473
Errata sheet inserted.

This report describes the functions, organisation, staffing, unclassified research activities and ad-hoc investigations in progress in the Structures Division, Aeronautical Research Laboratories during the year 1979/80. (Author)

AD-A109 054/7 PC **A10**/MF **A01**
George Washington Univ., Washington, DC. Dept. of Civil, Mechanical, and Environmental Engineering.
Fracture and Fatigue Characterization of Aircraft Structural Materials under Biaxial Loading.
Final scientific rept. 1 Oct 76-30 May 80,
D. L. Jones, and J. Eftis. Dec 81, 204p AFOSR-TR-81-0856
Grant AFOSR-76-3099

A general fracture mechanics analysis was performed to examine the influence of biaxial applied loads on the mechanical state of the body. The geometries examined were the single crack and two coplanar cracks with an arbitrary orientation and the cracked shear panel. It was found that the biaxial loads influenced all aspects of the mechanical state of the body, with the exception of the stress intensity factor for a crack oriented parallel to the biaxial load. The extent and nature of the biaxial effect on the crack-tip stress field, stress intensity factor, angle of initial crack extension, crack-tip displacements, elastic strain energy, fracture load and fatigue crack growth rates are all discussed. A biaxial test facility was developed and a considerable number of photoelastic, fracture toughness, and fatigue crack growth rate experiments were performed. Confirmation of the analytical predictions was obtained for the biaxial effects on the crack-tip stress field, the angle of initial crack extension, the fracture load, and the fatigue crack growth rates. The biaxial loads were seen to influence all of these parameters in varying degrees.

AD-A109 181/8 PC **A10**/MF **A01**
Kaman Aerospace Corp., Bloomfield, CT.
Structural System Identification Technology Verification.
Final rept.,
N. Giansante, A. Berman, W. G. Flannelly, and E. J. Nagy. Nov 81, 218p R-1631, USAAVRADC-TR-81-D-28
Contract DAAK51-78-C-0017

Structural system identification is the method of obtaining structural and dynamic mathematical models and improving existing mathematical models using ground vibration test data. The purpose of the subject program was to perform experimental, development, and research work to verify the concepts of structural system identification technology. To accomplish this, system identification techniques were applied to a U. S. Army AH-1G helicopter fuselage to create a mathematical model from ground vibration test data, to improve a reduced model of an existing NASTRAN model of the AH-1G using shake test data, and to test the effectiveness of these new mathematical models in predicting the effects of stiffness and mass changes to the airframe. The results of the program indicate that system identification is a viable and cost-effective technique for developing new models and for improving existing finite-element models of an airframe using ground vibration test data. (Author)

AD-A109 274/1 PC **A18**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Tactical Airborne Distributed Computing and Networks.
Conference proceedings.
Oct 81, 414p Rept no. AGARD-CP-303
Presented at a Meeting of the Avionics Panel Held in Roeros, Norway, 22-25 Jun 81.

These proceedings consist of the papers and discussions. The 35 papers were divided as follows, three on state-of-the-art; five on system architecture; four on system design approaches; five on software; five on fault tolerance and reliability; six on interconnection, bussing and networking; seven on applications to avionics systems.

AD-A109 290/7 PC **A11**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Design Manual for Impact Damage Tolerant Aircraft Structure,
John G. Avery. Oct 81, 240p Rept no. AGARD-AG-238

The Manual presents a methodology for integrating projectile impact damage tolerance into aircraft structural design. The information is presented in three sections: (1) Description of Projectile Threats; (2) Analysis Methods for Predicting Structural Response to Projectile Impact; and (3) Design Guidelines for Impact Tolerance. This report has been prepared at the request of the Structures and Materials Panel of AGARD.

AD-A109 291/5 PC **A09**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Aircraft Corrosion.
Conference proceedings.
Aug 81, 199p Rept no. AGARD-CP-315
Text in English and French. Presented at the AGARD Structures and Materials Panel (52nd), Cesme, Turkey, 5-10 Apr 81.

Aircraft corrosion is a very expensive phenomenon in terms of cost, inspection, maintenance and repair manpower requirements, or decreased aircraft availability. This meeting responded to the perception that improved communication between the corrosion R&D, the design and engineering, and the operating and maintenance communities should be helpful in anticorrosion efforts. Presentations were given from each of these communities and, together with the scheduled discussions, were intended to improve the intercommunity communication. Recommendations were agreed for desirable future action in this field.

AD-A109 330/1 PC **A03**/MF **A01**
Vought Corp., Dallas, TX.
Development of Navy Aircraft Baseline Reliability Prediction Models. Volume I. Executive Summary.
Final technical rept. 27 Apr 79-27 Feb 80,
F. D. Ferguson, J. O. Kolson, and J. T. Stracener. 27 Feb 80, 42p Rept no. 2-30101/OR-52376-1
Contract N00019-79-C-0355

Models were developed for prediction of baseline reliability characteristics of notional (conceptual) Navy fixed wing and rotary wing aircraft. Each model consists of a set of mathematical equations relating two-digit Work Unit Code subsystem Mean Flight Hours Between Failures (MFHBF) to aircraft design/performance parameters. The prediction equations were derived using MFHBF data and aircraft design/performance parameters from each of 43 representative historical Navy aircraft. Candidate predictor variables consisted of 101 design/performance parameters for fixed wing aircraft and 89 design/performance parameters for rotary wing aircraft. A summary of development of the baseline reliability prediction models is presented in Volume I. The models and application procedure are contained in Part I of Volume II, User's Guide, while data base development, technical approach, and model validation appear in Part II.

AD-A109 377/2 PC **A05**/MF **A01**
Kaman Aerospace Corp., Bloomfield, CT.
Development of Manufacturing Technology for Fabrication of a Composite Helicopter Main Rotor Spar by Tubular Braiding.
Final rept. Sep 78-Sep 80,
Mark L. White. Apr 81, 81p R-1618, USAAVRADCO-TR-81-F-9
Contract DAAG46-78-C-0070

Mechanical tubular braiding has been shown to be a viable blade spar manufacturing process in a program which included preliminary design of an improved main rotor blade for the OH-58 helicopter. The blade incorporates an advanced aerodynamic shape and has as its primary structural member a Kevlar 49/epoxy spar fabricated by braiding. Achievement of an analytically acceptable blade and spar design meeting critical structural and dynamic requirements was not hindered by braiding process constraints. Mechanical property tests of flat panels and spar sections exhibited excellent correlation with analytical predictions, substantiating the applicability of normal composite laminate analysis methods and the validity of the specific design. Ballistic testing of spar sections demonstrated superior containment of structural damage compared to composite spars produced by more conventional methods. Manufacturing cost estimates predict a price reduction of 1/3 for the braided spar relative to a similar S-glass/epoxy spar for an OH-58 blade of identical external shape fabricated by orthodox, low-cost technology. (Author)

AD-A109 405/1 PC **A04**/MF **A01**
Army Aviation Engineering Flight Activity, Edwards AFB, CA.
Helicopter Icing Spray System (HISS) Nozzle Improvement Evaluation.
Final rept.,
Daumants Belte. Sep 81, 53p Rept no. USAAEFA-79-02-2

The U.S. Army Aviation Engineering Flight Activity (USAAEFA) operates a modified CH-47C helicopter as an airborne spray tanker to create a simulated icing test environment. This Helicopter Icing Spray System (HISS) was modified in 1979 to improve its spray cloud characteristics with respect to uniformity of liwuid water content (LWC) and reduction of drop size median volumetric diameter (MVD). The existing atomizers on the spray boom assembly were replaced by Sonic Development Corporation model 125-H 'Sonicore' nozzles. A UH-1H helicopter equipped with particle measuring spectrometers conducted in-flight sampling and calibration of the modified HISS spray cloud during Jan - Mar 1980 at St. Paul, Minnesota in conjunction with other helicopter icing tests. Average cross sectional dimensions of the present spray cloud are estimated as 36 ft wide and 8 ft deep. Usable values of cloud LWC in excess of 1 gram per cubic meter with a drop size MVD range of 20 to 35 microns could be generated at a 90 knot airspeed. This represents a vast improvement over the artificial cloud of previous years, and overlaps the MVD range representative of natural icing clouds. Test aircraft ice formations produced with the artificial cloud compared favorably with those seen in the natural environment.

N82-14049/2 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Optimization and Performance Calculation of Dual-Rotation Propellers.
R. E. Davidson. Dec 81, 48p NASA-TP-1948, L-14678

An analysis is given which enables the design of dual-rotation propellers. It relies on the use of a new tip loss factor deduced from T. Theodorsen's measurements coupled with the general methodology of C. N. H. Lock. In addition, it includes the effect of drag in optimizing. Some values for the tip loss factor are calculated for one advance ratio.

N82-14052/6 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Experimental and Analytical Investigation of Axisymmetric Supersonic Cruise Nozzle Geometry at Mach Numbers from 0.60 to 1.30.
G. T. Carson, Jr., and E. E. Lee, Jr.. Dec 81, 89p NASA-TP-1953, L-14661

Quantitative pressure and force data for five axisymmetric boattail nozzle configurations were examined. These configurations simulate the variable-geometry feature of a single nozzle design operating over a range of engine operating conditions. Five nozzles were tested in the Langley 16-Foot Transonic Tunnel at Mach numbers from 0.60 to 1.30. The experimental data were also compared with theoretical predictions.

N82-14058/3 PC **A09**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
A Flight Investigation of Blade-Section Aerodynamics for a Helicopter Main Rotor Having 10-64C Airfoil Sections.
C. E. K. Morris, Jr. Nov 81, 181p NASA-TM-83226

Pressure data at 90 percent blade radius were obtained for a helicopter main rotor with 10-64C blade sections during flight. Concurrent measurements ere made of vehicle flight state, performance and some rotor loads. The test envelope included hover, level flight from about 65 to 162 knots, climb and descent, and collective fixed maneuvers. Good agreement is shown between some sets of airfoil pressure distributions obtained in flight and those from two-dimensional wind-tunnel tests or theoretical calculations.

N82-14529/3 PC **A03**/MF **A01**
Flow Research Co., Kent, WA.
Development of an Efficient Procedure for Calculating the Aerodynamic Effects of Planform Variation.
Final Report.
J. E. Mercer, and E. W. Geller. Dec 81, 36p NASA-CR-3489, FLOW-RR-186
Contract NAS1-15977

Numerical procedures to compute gradients in aerodynamic loading due to planform shape changes using panel method codes were studied. Two procedures were investigated: one computed the aerodynamic perturbation directly; the other computed the aerodynamic loading on the perturbed planform and on the base planform and then differenced these values to obtain the perturbation in loading. It is indicated that computing the perturbed values directly can not be done satisfactorily without proper aerodynamic representation of the pressure singularity at the leading edge of a thin wing. For the alternative procedure, a technique was developed which saves most of the time-consuming computations from a panel method calculation for the base planform. Using this procedure the perturbed loading can be calculated in about one-tenth the time of that for the base solution.

N82-14879/2 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Experimental Study of Noise Reduction for an Unstiffened Cylindrical Model of an Airplane Fuselage.
C. M. Willis, and E. F. Daniels. Dec 81, 36p NASA-TP-1964, L-14878

Noise reduction measurements were made for a simplified model of an airplane fuselage consisting of an unstiffened aluminum cylinder 0.5 m in diameter by 1.2 m long with a 1.6-mm-thick wall. Noise reduction was first measured with a reverberant field pink-noise load on the cylinder exterior. Next, noise reduction was measured by using a propeller to provide a more realistic noise load on the cylinder. Structural resonance frequencies and acoustic reverberation times for the cylinder interior volume were also measured. Comparison of data from the relatively simple test using reverberant-field noise with data from the more complex propeller-noise tests indicates some similarity in both the overall noise reduction and the spectral distribution. However, all of the test parameters investigated (propeller speed, blade pitch, and tip clearance) had some effect on the noise-reduction spectra. Thus, the amount of noise reduction achieved appears to be somewhat dependent upon the spectral and spatial characteristics of the flight conditions. Information is also presented on cyclinder resonance frequencies, damping, and characteristics of propeller-noise loads.

N82-14880/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Prediction of Flyover Jet Noise Spectra from Static Tests.
U. Michel, and A. Michalke. Dec 81, 27p NASA-TM-83219, L-14953
Presented at the 100TH Meeting of the Acoust. Soc. Of AM., Los Angeles, Nov. 1980.

A scaling law is derived for predicting the flyover noise spectra of a single-stream shock-free circular jet from static experiments. The theory is based on the Lighthill approach to jet noise. Density terms are retained to include the effects of jet heating. The influence of flight on the turbulent flow field is considered by an experimentally supported similarity assumption. The resulting scaling laws for the difference between one-third-octave spectra and the overall sound pressure level compare very well with flyover experiments with a jet engine and with wind tunnel experiments with a heated model jet.

1D. Aircraft Flight Control and Instrumentation

AD-A109 373/1 PC **A02**/MF **A01**
Institute for Defense Analyses, Arlington, VA.
Assessment of Avionic Equipment Field Reliability and Maintainability as Functions of Unit Cost,
Mark I. Knapp, and Joseph W. Stahl. 7 Oct 81, 24p
Presented at the Annual Department of Defense Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

Pound-for-pound, avionics is generally recognized as the most expensive, complex and sophisticated part of an aircraft. Reliability and maintainability are critical characteristics that influence spares provisioning, maintenance resource requirements, system operational availability and, ultimately, investment and operating costs. Consequently, much attention has been focused upon improving the reliability and maintainability of avionics which, in the past, have been disappointingly low. This paper addresses avionics reliability and maintainability. The analysis was performed last year in partial response to a request of IDA by OASD (C(3)I) to provide information for use by DSARC principals at the Full-Scale Development milestone. Since the 5000 series of DoD Directives and Instructions emphasize analytical comparisons of any new systems under consideration by the DSARC with current, comparable systems, we undertook analyses to determine if there may be one or more historical relationships between field reliability and maintainability and avionic equipment characteristics that would assist in forecasting those attributes.

N82-14085/6 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
A General Aviation Simulator Evaluation of a Rate-Enhanced Instrument Landing System Display.
D. A. Hinton. Dec 81, 44p NASA-TP-1960, L-13911

A piloted-simulation study was conducted to evaluate the effect on instrument landing system tracking performance of integrating localizer-error rate with raw localizer and glide-slope error. The display was named the pseudocommand tracking indicator (PCTI) because it provides an indication of the change of heading required to track the localizer center line. Eight instrument-rated pilots each flew five instrument approaches with the PCTI and five instrument approaches with a conventional course deviation indicator. The results show good overall pilot acceptance of the display, a significant improvement in localizer tracking error, and no significant changes in glide-slope tracking error or pilot workload.

N82-14806/5 PC **A04**/MF **A01**
Duke Univ., Durham, NC. Dept. of Computer Sciences.
A Tutorial on the Care III Approach to Reliability Modeling.
Interim Report.
K. S. Trivedi, and R. M. Geist. Dec 81, 63p NASA-CR-3488
Contract NAG1-70

The CARE 3 reliability model for aircraft avionics and control systems is described by utilizing a number of examples which frequently use state-of-the-art mathematical modeling techniques as a basis for their exposition. Behavioral decomposition followed by aggregration were used in an attempt to deal with reliability models with a large number of states. A comprehensive set of models of the fault-handling processes in a typical fault-tolerant system was used. These models were semi-Markov in nature, thus removing the usual restrictions of exponential holding times within the coverage model. The aggregate model is a non-homogeneous Markov chain, thus allowing the times to failure to posses Weibull-like distributions. Because of the departures from traditional models, the solution method employed is that of Kolmogorov integral equations, which are evaluated numerically.

PB82-862491 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Head Up Displays. 1975-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1975-Feb 82.
Feb 82, 156p
Supersedes PB80-809072.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

Head Up Displays (HUDs) are the subject of the bibliography from much of the world aerospace literature. Design, fabrication and use, and applications to specific aircraft, such as the F-4E, Jaguar, Tornado, F-18, Viggin, A-10, AV-8B, sea harrier, space shuttle, helicopters, KC-135S, and in commercial aircraft, are discussed. A look at the future in this field is also presented. (This updated bibliography contains 161 citations, 91 of which are new entries to the previous edition.)

PB82-862509 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Head Up Displays. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 211p
Supersedes PB80-809064.

Head Up Displays (HUDs) are the subject of this bibliography from Government sponsored research. Design, fabrication and use, and applications to specific aircraft, such as the F-4E, Jaguar, Tornado, F-18, Viggin, A-10, AV-8B, sea harrier, space shuttle, helicopters, KC-135S, and in commercial aircraft, are discussed. A look at the future in this field is also presented. (This updated bibliography contains 161 citations, 41 of which are new entries to the previous edition.)

2.

AGRICULTURE

2B. Agricultural Economics

PB82-141524 PC **A06**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Agricultural Bargaining: Process - Problems - Potentials.
Final rept.
Oct 81, 118p ACS/SR-6
Proceedings of the National Bargaining Conference (25th) held at the Diplomat Hotel, Hollywood Beach, Florida, January 15-18, 1981.

In this Proceedings of the 25th National Conference on Bargaining and Marketing Cooperatives, various speakers reflected their views as to the present status of bargaining cooperatives and offered suggestions for future progress of these cooperatives. Speeches in this Proceedings cover such diverse subjects as political and economic bargaining power prospects; the mechanics of bargaining; bargaining associations and processing cooperatives relationships; and bargaining in the future.

PB82-150178 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Cost of Milk Production in Seven Major Milk Protein Exporting Countries and the United States.
Staff rept.,
Lynn A. Austin. Sep 81, 39p AGES-810922

This study informs public policymakers of the relative costs of producing milk in countries which export casein to the United States. A budgeting technique was applied to secondary data. Only New Zealand, Australia, and Ireland had discernibly lower costs than the United States. Cost levels in Argentina, France, West Germany, and the Netherlands were similar to those in the United States.

PB82-150434 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
The Role of Wheat in Indonesia's Food System.
Foreign agricultural economic rept.,
Stephen L. Magiera. Dec 81, 67p FAER-170

Wheat flour consumption in Indonesia is highly responsive to income growth and changes in wheat and rice prices. Indonesian wheat imports could reach 1.9 million metric tons or more in 1985, depending upon whether the Government pursues an active policy of encouraging imports. The U.S. share of that market could be more than 1 million tons. Raising the price of rice is the most direct means by which the Indonesian Government can both lower the cost of imported food and reduce the country's reliance on the international rice market. The study examines recent trends in Indonesian wheat imports, current marketing and price mechanisms, and Government policy toward wheat.

PB82-153016 PC **A03**/MF **A01**
Statistical Reporting Service (USDA), Washington, DC.
The Development of County Estimates in North Carolina,
Barry L. Ford. Nov 81, 42p AGES-811119

The purpose of this report is to describe and evaluate the survey design and county estimators for the 1979 Probability Crop and Livestock Survey (PCLS) in North Carolina. Using data from the 18,361 respondents to the 1979 PCLS, this study analyzed three county level estimators--the direct, synthetic, and composite estimators. For the data set in this study the composite estimates differed very little from the direct estimates.

PB82-156217 PC **A02**/MF **A01**
Statistical Reporting Service (USDA), Washington, DC.
An Analysis of 1979 Nebraska Rotation Plan for the Quarterly Hog Survey,
Chapman P. Gleason. Jun 81, 15p AGESS810615

This paper summarizes procedures and estimators used in the analysis of a rotation sampling plan in Nebraska for the 1979 quarterly hog surveys.

2C. Agricultural Engineering

AD-A108 834/3 PC **A02**/MF **A01**
Ohio Agricultural Research and Development Center, Wooster.
Sediment Deposits in Drainage Ditches.
Final rept.,
D. Lynn Forster, and Girmai Ibrahim. Nov 80, 20p
Contract DACW49-80-C-0016

The purpose of this study is to estimate one of the off farm costs of cropland soil loss, sediment removal from drainage ditches. Information is compiled about the cost of sediment removal, characteristics of the drainage ditch and land area draining into the ditch.

PB82-153339 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Prospects for Ground-Water Irrigation: Declining Levels and Rising Energy Costs,
Gordon Sloggett. Dec 81, 50p AER-478

Ground water, an irreplaceable resource tapped from underground reservoirs, is decreasing in 11 major irrigating States. Pumping from greater depths will add to irrigation fuel costs, but rising energy prices will likely be a more serious constraint to expanded groundwater irrigation. Declining ground-water levels may not significantly reduce the irrigated area in the United States until well into the next century.

PB82-153727 PC **A09**/MF **A01**
North Carolina Water Resources Research Inst., Raleigh.
Economic and Technical Evaluations of Swine Manure Management Systems Which Use Land Application,
Ross G. Drynan, J. C. Williamson, Philip W. Westerman, and Stuart R. Crane. Sep 81, 177p
UNC-WRRI-81-173, W82-02175, OWRT-A-098-NC(1)
Contract DI-14-34-0001-8035
Prepared in cooperation with North Carolina State Univ. at Raleigh.

The trend towards more and larger confinement swine production operations has meant that larger quantities of localized manure have to be dissipated in cost-efficient and environmentally acceptable ways. Land application of the manure to agricultural crops represents an excellent manure utilization scheme as well as sound environmental management when application rates are based on crop nutrient requirements. Collection of waste management technical data and evaluation of the economics of the various feasible alternative manure management systems were the major objectives of this project. In this study, the major facilities, treatment, and land application options for liquid swine manure were identified and investment and operating costs were estimated. A mathematical integer linear programming model was developed to estimate costs of manure management systems and to determine which of the systems was the optimal or least-cost system.

PB82-154592 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Irrigating with Municipal Effluent: A Socioeconomic Study of Community Experiences,
Lee A. Christensen. Jan 82, 57p ERS-672
Prepared in cooperation with Robert S. Kerr Environmental Research Lab., Ada, OK.

This study examines experiences of eight communities using land to treat municipal effluents. Most systems evolved without long-range planning. No distinct methods for land acquisition and management related to the size of the community were identified. Factors identified as important for successful systems operation included a long planning horizon and good working relationships between community officials and landowners.

2D. Agronomy and Horticulture

PB82-156241 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Pesticide Use on Vegetables in the Southeast.
Preliminary rept.,
Walter L. Ferguson, and Iris E. McCalla. Oct 81, 36p AGES-811029

According to the 1979 Vegetable Pesticide Survey, nearly 1 million pounds of pesticides were used to control weeds, insects, diseases, and nematodes on seven vegetable crops in North Carolina, South Carolina, and Georgia. The seven vegetable crops include cabbage, cantaloups, cucumbers, snap beans, sweet corn, tomatoes, and watermelons. About 378,000 acre-treatments were made ranging from 133,000 for tomatoes to 13,000 for cantaloups.

2E. Animal Husbandry

PB82-146440 PC **A99**/MF **A01**
National Research Council, Washington, DC.
Mammalian Models for Research on Aging.
Feb 81, 606p ISBN-0-309-0394-3
Contract N01-AG-7-2118
Library of Congress catalog card no. 80-24383.

The primary focus of this report is the relevance and appropriateness of selected mammals as models of human aging. Animal experimentation provides a scientifically valid and ethical approach to the development of new knowledge and contributes to human and animal welfare. In this sense, the scientific moral justification for using animals in research on aging is the same as for other areas of biomedical significance. Legal, ethical, and practical constraints limit the extent to which human subjects can be used in research on aging. Moreover, an understanding of human aging requires basic research on relevant biological principles and phenomena. Man is not an appropriate subject for much of this type of research. Accordingly, utilization of many biological systems and animal species is necessary to study the scientific questions that are relevant to human aging.

2F. Forestry

AD-A108 859/0 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XX. Manilkara.
Research paper,
B. F. Kukachka. Jun 81, 16p Rept no. FSRP-FPL-371
See also Volume 21, AD-A108 860.

Consisting of about 32 neotropical species, the genus Manilkara has a widespread distribution in the Americas ranging from southeastern Brazil and northern Bolivia as far north as southern Florida. It is probably the most important of the American genera, being the source of commercial timbers, fruits, and gums. Manilkara, as constituted here, consists of a generic complex that includes Achras, Muriaeanthe, Schaferodendron, Manilkariopsis, and Chicleа. This 'complex' exhibits remarkable anatomical uniformity; the variability exhibited between 'genera' is no greater than that which may be encountered within a single species. (Author)

AD-A108 860/8 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXI. Barylucuma.
Research paper,
B. F. Kukachka. May 81, 6p Rept no. FSRP-FPL-372
See also Volume 22, AD-A108 861.

Barylucuma decussata, the sole member of the genus, was established in 1925 by Adolpho Ducke. Eyma (1936) suggested its affinity with Pouteria and Baehni (1942) made the new combination Bouteria decussata (Ducke) Baehni. Ducke (1942) revised his opinion regarding the status of his new genus indicating that was untenable but did not suggest its placement in one of the known genera. Aubreville (1961) retained Barylucuma as distinct. Anatomically and physically the wood of Barylucuma is similar to certain species of Neoxythece, Paralabatia and Myrtiluma, but seems to be most closely allied with Podoluma. (Author)

AD-A108 861/6 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXII. Pradosia.
Research paper,
B. F. Kukachka. 1981, 12p Rept no. FSRP-FPL-373
See also Volume 23, AD-A108 862.

As constituted here, the genus Pradosia consists of a group of closely related species including the species attributed to Glycoxylon and Neopometia. The members of Pradosia are readily separable anatomically from other American Sapotaceae by the presence of silica in the wood rays and of microcrystals (crystal sand) in the axial parenchyma. Although Podoluma does share these features with Pradosia, it has much larger pores arranged in a clustered-echelon arrangement. (Author)

AD-A108 862/4 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXIII. Gayella.
Research paper,
B. F. Kukachka. May 81, 6p Rept no. FSRP-FPL-374
See also Volume 24, AD-A108 863.

Gayella splendens (A. DC.) Aubr., the sole member of this genus, is a tall shrub, endemic to Chile. Baehni and Eyma place G. splendens in Pouteria but Aubreville recognizes Gayella as distinct. Anatomically, the alliance of Gayella is not with Pouteria but with Pradosia and particularly with lactescens and ptychandra. (Author)

AD-A108 863/2 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXIV. Ecclinusa.
Research paper,
B. F. Kukachka. May 81, 8p Rept no. FSRP-FPL-395
See also Volume 27, AD-A108 864.

Ecclinusa is a small genus of South American species characterized by their pale-brown, roseate, or sometimes rust-colored woods of moderate density (specific gravity averages 0.71). The small pores are in clustered-echelon arrangement or in laterally spaced files in echelon or radial arrangement. Ecclinusa is a silica accumulating genus, attaining concentrations of 2.05 percent in E. guianensis. Since its inception in 1839, the genus has remained remarkably stable and has accumulated a minimal amount of synonomy.

AD-A108 864/0 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXVII. Sarcaulus.
Research paper,
B. F. Kukachka. May 81, 7p Rept no. FSRP-FPL-398
See also Volume 24, AD-A108 863.

This study is based on wood specimens of Sarcaulus brasiliensis (A.DC.) Eyma which was, for a long time, the sole representative of the genus. A second species, S. wurdackii Aubr., was described in 1965 from Peru. Wood of the latter species was not available for study. The genus is anatomically well-defined and, although the topography is rather similar to some species of Ecclinusa and Ragala, it can be readily separated by several anatomical features. (Author)

AD-A108 906/9 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXVI. Myrtiluma.
Forest Service research paper,
B. F. Kukachka. May 81, 7p Rept no. FSRP-FPL-397
See also AD-A108 864.

The wood of Myrtiluma ranks amongst the heaviest of the neotropical Sapotaceae and by this physical character alone it would not be confused with any species of Micropholis. Anatomically the wood exhibits little affinity with Pouteria (sensu Aubreville) but physically and anatomically is remarkably similar to Sandwithiodoxa from which it differs primarily with respect to pore arrangement. This species ranges from French Guiana to Venezuela and the northern Amazon Basin.

AD-A108 913/5 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Anatomy of the Neotropical Sapotaceae. XXV. Ragala.
Research paper,
B. F. Kukachka. May 81, 8p Rept no. FSRP-FPL-396
See also AD-A108 906.

Ragala is a small genus of four species limited to the Guianas and the Amazon Basin. At one time its species were included in the genus Ecclinusa and another time both Ecclinusa and Ragala were a part of the very large genus Chrysophyllum. This study of the wood anatomy supports the separation of Ecclinusa and Ragala as well as their removal from Chrysophyllum. Ragala is a silica-accumulating genus. (Author)

PB82-153677 PC **A05**/MF **A01**
New Hampshire Univ., Durham. Water Resources Research Center.
The Effect of Forest Clearcutting in New England on Stream-Water Chemistry and Biology,
C. Wayne Martin, Diane S. Noel, and C. Anthony Federer. Jul 81, 86p RR-34, W82-02178, OWRT-A-051-NH(1)
Contract DI-14-34-0001-8031
Prepared in cooperation with Northeastern Forest Experiment Station, Durham, NH.

Changes in stream chemistry following clearcutting were sought in 56 streams at 15 locations throughout New England. Streams draining clearcut areas were compared with nearby streams in uncut watersheds over periods of up to 2 years. In general, concentrations of all elements studies (inorganic N, SO4 - S, Cl, Ca, Mg, K, Na), as well as pH and specific conductivity, varied as much among uncut streams at a location as between uncut and cutover streams. The greatest differences occurred with nitrogen in northern hardwood forests in the White Mountains of New Hampshire. Both algal and invertebrate densities were greatest in cutover streams.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-A109 186/7 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
A Comparison of the SAOC with the AGK3 Hemispherical Expansions.
Technical rept.,
Laurence G. Taff. 21 Oct 81, 38p TR-581, ESD-TR-81-286
Contract F19628-80-C-0002

This is the second report on the systematic differences between the AGK3 and SAOC positions and proper motions. The general theory of formulating such differences, in three different circumstances, is developed and the method of (hemi)spherical harmonics applied. Magnitude and color terms are treated, through terms quadratic in m and c, by extending the variable space via tensor product spaces. The statistical significance of an expansion coefficient is ascertained by the F test. Also included is a discussion of the time dependence of these differences and a resolution of most of the poorly matching stars (Table 2 of Part I). (Author)

AD-A109 329/3 PC **A02**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Longitude Determination by Two Different Stars Observed at the Same Altitude East and West of the Meridian,
Angel A. Baldini. 14 Mar 81, 10p Rept no. ETL-R030

The determination of time by east and west observation of the zenith distance of a star near the prime vertical shows discrepancies as much as 2 seconds of time. A new method with higher accuracy has been developed. It is based on observation of an individual pair of stars. The observation of each star (one east, the other west of the meridian) consists of determining the instant of time at which it crosses a fixed preselected unknown zenith in order to determine the circumstances when greatest accuracy can be expected. (Author)

N82-15007/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Kohoutek, Photometric Photography Experiment (S233).
Final Report.
C. A. Lundquist, and P. D. Craven. Oct 81, 35p
NASA-TM-82449

The final results of the Skylab 4 experiment S233, Kohoutek photometric photography experiment, which undertook a series of visible light photographs suitable for photometry and for a photographic history of Comet Kohoutek are described. The experiment concept, the data reduction method, and the results obtained are discussed.

3B. Astrophysics

ASESSR-A-3(1979) PC **A02**/MF **A01**
Akademiya Nauk Estonskoi SSR, Tartu. Inst. Astrofiziki i Fiziki Atmosfery.
Superclusters and Galaxy Formation.
J. Einasto, M. Joeveer, and E. Saar. 1979, 13p
U.S. Sales Only.

The spatial distribution of Galaxies and Galaxy congestions in the southern galactic hemisphere is stud-

ied. The rich galaxy congestions, containing many elliptic Galaxies and radiogalaxies, are linked with each other by chains of scanty congestions with moderate content of elliptic Galaxies and radiogalaxies. The flat formation, linking the density pikes and the intermediate chains, can reasonably be called supercongestion. In the central region of supercongestions there is a thin layer of Galaxies consisting of only spiral Galaxies. The neighbouring supercongestions touch each other, while the intersupercongestion space contains no Galaxy congestions and almost no Galaxies. It is shown that such a structure was, apparently, formed before the formation of Galaxies. (Atomindex citation 12:579471)

CEA-CONF-5240 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Rayleigh-Taylor Instabilities in the Interstellar Medium.
Marc Lachieze-Rey. Jun 80, 2p CONF-8006211-2(Sum)
94. IUPAP/IAU symposium on origin of cosmic rays, Bologna, Italy, 11 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5241 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Cosmic-Ray Self-Confinement in the Hot Phase of the Interstellar Medium.
C. J. Cesarsky, and R. M. Kulsrud. Jun 80, 3p
U.S. Sales Only.

No abstract available.

CEA-CONF-5242 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Cosmic-Ray Injection into Shock-Waves.
C. J. Cesarsky, and J. -P. Bibring. Jun 80, 2p
U.S. Sales Only.

No abstract available.

CEA-CONF-5243 PC **A03**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Particle Acceleration by Pulsars.
J. Arons. Jun 80, 30p
U.S. Sales Only.

The evidence that pulsars accelerate relativistic particles is reviewed, with emphasis on the gamma -ray observations. The current state of knowledge of acceleration in strong waves is summarized, with emphasis on the inability of consistent theories to accelerate very high energy particles without converting too much energy into high energy photons. The state of viable models for pair creation by pulsars is summarized, with the conclusion that pulsars very likely lose rotational energy in winds instead of in superluminous strong waves. The relation of the pair creation models to gamma -ray observations and to soft X-ray observations of pulsars is outlined, with the conclusion that energetically viable models may exist, but none have yet yielded useful agreement with the extant data. Some paths for overcoming present problems are discussed. The relation of the favored models to cosmic rays is discussed. It is pointed out that the pairs made by the models may have observable consequences for observation of positrons in the local cosmic ray flux and for observations of the 511 keV line from the interstellar medium. Another new point is that asymmetry of plasma supply from at least one of the models may qualitatively explain the gross asymmetry of the X-ray emission from the Crab nebula. It is also argued that acceleration of cosmic ray nuclei by pulsars, while energetically possible, can occur only at the boundary of the bubbles blown by the pulsars, if the cosmic ray composition is to be anything like that of the known source spectrum. (Atomindex citation 12:576617)

CEA-CONF-5244 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Cosmic Rays from Regions of Star Formation: I. The Carina Complex.
T. Montmerle, J. A. Paul, and M. Casse. Jun 80, 2p CONF-8006211-5(Sum)
94. IUPAP/IAU symposium on origin of cosmic rays, Bologna, Italy, 11 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5246 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Cosmic Rays from Regions of Star Formation: III. The Role of T-Tauri Stars in the Rho Oph Cloud.
J. A. Paul, M. Casse, and T. Montmerle. Jun 80, 2p CONF-8006211-6(Sum)
94. IUPAP/IAU symposium on origin of cosmic rays, Bologna, Italy, 11 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5247 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Wolf-Rayet Stars and the Origin of the exp 22 Ne Excess in Cosmic Rays.
M. Casse, J. A. Paul, and J. P. Meyer. Jun 80, 2p CONF-8006211-7(Sum)
94. IUPAP/IAU symposium on origin of cosmic rays, Bologna, Italy, 11 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5248 PC **A03**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Div. de la Physique.
HEAO-3 French-Danish Cosmic Ray Spectrometer. Preliminary Results on the Elemental Abundances of Cosmic Ray Nuclei in the Iron Peak.
J. J. Engelmann. Jun 80, 33p CONF-8006190-1
COSPAR topical meeting on life sciences and space research, Budapest, Hungary, 2 Jun 1980.
U.S. Sales Only.

The French-Danish cosmic ray spectrometer was launched on HEAO-3 on September 20, 1979. This instrument was optimized to measure the charge composition and isotopic abundances of galactic cosmic rays with energies of about 0.5 to 7 GeV/nucleon, using the multi-Cerenkov detector technique and a flash tube hodoscope. The geomagnetic method used for isotope analysis required the accurate measurement of the momentum of each observed particle. The technique used and the problems involved are illustrated using observed data. The high charge resolution of the instrument permits complete separation of all chemical elements between Be and Ni, even at energies larger than 5 GeV/nucleon. Preliminary results are presented for relative abundances of individual elements 21 <= Z <= 28. (Atomindex citation 12:576621)

CEA-CONF-5250 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service d'Electronique Physique.
Gamma Radiation Associated to Stellar Formation in the Galaxy (Cosmic Ray Astronomy).
M. Casse. May 80, 13p CONF-8005197-1
Meeting of the Belgian Physical Society, Liege, Belgium, 29 May 1980.
U.S. Sales Only.

The gamma ray sky revealed by the COS-B satellite is very peculiar: a few 'gamma ray stars' lying along the galactic plane emerge from a bright milky way. A possible interpretation of this sky is to invoke the existence of regions in which stars, cosmic rays and interstellar matter are very concentrated. A genetic link is established between clouds, stars and cosmic rays: the partial fragmentation of a cloud give birth to stars, the most massive stars accelerate cosmic rays through their supersonic stellar winds, cosmic ray interact in turn with the cloud material to copiously produce high energy gamma rays: a gamma ray source is born. (Atomindex citation 12:576622)

CENBG-7924 PC **A05**/MF **A01**
Bordeaux-1 Univ., Gradignan (France). Centre d'Etudes Nucleaires.
Cross Section Measurements for Long-Lived Isotopes and Their Interest in Astrophysics.
These (D. 3e Cycle),
J. Dedieu. Oct 79, 76p
In French.
U.S. Sales Only.

Cross sections for long-lived radionuclides exp 10 Be, exp 26 Al and exp 36 Cl were measured in Si, Ca, Ti and Fe targets bombarded with 0.15, 1 and 24 GeV protons, by using selective radiochemical separations and low-level counting methods. The results are discussed in terms of the propagation of galactic cosmic radiation. The applicability of the exp 21 Ne - exp 26 Al method for calculating the radiation ages of meteorites is criticized. (Atomindex citation 11:560999)

INIS-SU-1 PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Quasars as Objects with Visible Faster-Than-Light Expansion. Review.
G. A. Kotel'nikov. 1979, 36p
In Russian.
U.S. Sales Only.

A modern state of data on a phenomenon of superrelativistic expansion of 3C273B, 3C279, 3C345 quasars and the Seyfert radiogalaxy 3C120 is stated. Experimental methods for the observation of the above phenomenon related to the creation of radiointerferometers in the cantimeter range with a superlong base are considered. A problem of interpretation of phenomenon of superrelativistic quasar expansion is investigated. Several possible hypotheses for the effect explanation are suggested. It is noted that at present it is not possible to choose unambiguously one or another explanation. It is necessary to continue the systematic experimental study on the phenomenon. (Atomindex citation 12:603407)

INIS-mf-6287 PC **A17**/MF **A01**
Akademiya Nauk SSSR, Leningrad. Fiziko-Tekhnicheskii Inst.
Ninth Conference on Cosmophysics in Leningrad. Proceedings of Seminar on Interaction of Cosmic Rays with Atmosphere.
1979, 400p CONF-7911157-
Conference on cosmophysics in Leningrad, Leningrad, USSR, 30 Nov 1979.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Separate abstracts were prepared for each of the included papers. (ERA citation 07:005699)

ITEF-134(1979) PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Dynamical Model of the Type I Supernova Atmosphere with the Velocity Gradient.
V. S. Imshennik, D. K. Nadezhin, and V. P. Utrobin. 1979, 36p
In Russian.
U.S. Sales Only.

The notion of a compact structure of a low-mass Type I presupernovae is assumed to be a principle of hydrodynamic problem dealing with the supernova Type I (SNI) envelope outbursts. This structure is characterized by a degenerated carbon-oxide core, which is near to a thermonuclear explosion of carbon core (M sub 0 approximately equal to 1.40 Msub(sun) and by a compact low-mass envelope (Msub(e)< or approximately 0.1 Msub(sun)) with external radius Rsub(e) approximate y equal to 10sup(9) cm. The parameters of this hydrostatic envelope are specified and then, for a relatively small explosion energy, W sub 0 approximately equal to (2-10) 10 exp 49 erg, hydrodynamic problem of the envelope ejection is solved numerically. This energy comes from neutrino-induced detonative carbon burning. The SNI light curves are considered to occur due to an additional slow (with time-scale 10 exp 6 -10 exp 7 s) release of the bulk of the SNI energy, W approximately equal to 10 exp 51 erg. (Atomindex citation 11:567413)

ITEF-98(1980) PC **A04**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Final Stages of Star Evolution and the Hydrodynamic Theory of Supernova Bursts. A Detailed Review.
V. S. Imshennik, and D. K. Nadezhin. 1980, 66p
In Russian.
U.S. Sales Only.

A review of physico-mathematical formulations and results of solution of the tasks related to the final stages of star evolution and supernova bursts is presented. Physical properties of substances inside the star -

which include equations of the substance state, kinetics of weak interactions and transfer of neutron irradiation - are described. The main attention is paid to hydrodynamic theory of thermonuclear explosion and gravitational collapse of carbon-oxygen and iron-oxygen nuclei of stars as well as to hydrodynamic theory of supernova bursts. A problem of chemical element synthesis important for the further development of the theory is briefly discussed. (Atomindex citation 12:603507)

ITF-79-138R PC **A03**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Construction of the Fundamental Oscillator Strengths and Abundance Scales. Fe I.
E. A. Gurtovenko, and R. I. Kostyk. 1980, 45p
In Russian.
U.S. Sales Only.

The method of construction of internally consistent systems of oscillator strengths according to central intensities of the Fraunhofer lines of the solar spectrum is developed. For calculation of the intensities the Hallveger-Muller model is used, as well as log Asub(Fe)=7.525+-0.007. The oscillator strengths for 865 lines of Fe I with the +- 0.035 error are found. The iron content consistent with the system is equal to log Asub(Fe)=7.57+-0.01. (Atomindex citation 12:603508)

ITF-80-27R PC **A02**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Gas Sweeping from Central Regions of Galaxies with Active Nuclei.
S. A. Silich, and P. I. Fomin. 1980, 18p
In Russian.
U.S. Sales Only.

A mechanism of gas sweeping by shock waves from central regions of plane galaxies with active nuclei which is connected with the angular moment transfer from a stellar-cloud component to a gas one is considered. It is shown that shock waves are capable to form the observable density profile with the maximum at a distance of some kpc from galaxy centre for the time of the order of 10 exp 9 years. (Atomindex citation 12:603509)

ITF-80-61R PC **A03**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Isothermal Cloud Contraction by the Increasing Outer Pressure.
Yu. I. Izotov, and I. G. Kolesnik. 1980, 30p
In Russian.
U.S. Sales Only.

The self-consistent problem of the evolution of isothermal hydrostatic clouds with arbitrary cooling function under increasing outer pressure are solved, and the conditions for collapse of these clouds are formulated. It is shown that, when cooling is determined by the molecular hydrogen and the relative abundance of H sub 2 is less than 10 exp -3 , the first-generation protostars of masses M>10 exp 2 -10 exp 3 M will be formed. (Atomindex citation 12:603510)

ITP-79-64-E PC **A02**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Activity of Galactic Nuclei and Ring-Like Structures in Normal Galaxies.
P. I. Fomin, I. G. Kolesnik, and S. A. Silich. 1979, 10p
U.S. Sales Only.

Formation mechanism of ring-like structures in normal galaxies is discussed. The above structures observed in normal galaxies are possibly formed by shock waves generated by recurrent activity of galactic nuclei. Specific features of ring-like structures are connected with parameters (energy and period) characterizing the activity of nuclei, and with gas distribution type in central regions of galaxies as well. (Atomindex citation 11:567414)

KFKI-1980-46 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Interplanetary Transport of Solar Cosmic Rays.
T. I. Gombosi, and A. J. Owens. Jul 80, 9p
U.S. Sales Only.

Numerical solutions are presented for the propagation of solar cosmic rays in interplanetary space, including the effects of pitch-angle scattering and adiabatic focusing. The intensity-time profiles can be well fitted by a simple radial spatial diffusion equation with scattering mean-free path lambdasub(fit). The radial mean-free path so obtained is significantly larger than the true scattering mean-free path for low-rigidity particles due to both adiabatic focusing and the inapplicability of the diffusive approximation early in the event. The well-known discrepancy between lambdasub(fit) and the theoretical predictions may be resolved by these calculations. (Atomindex citation 11:567416)

N82-15001/2 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
The Discovery of 50 Minute Periodic Absorption Events from 4U1915-05.
N. E. White, and J. H. Swank. Oct 81, 18p NASA-TM-83839
Submitted for Publication.

The steady flux from 4U1916-05 which undergoes periodic absorption dips every 50 minutes was demonstrated. This period represents the underlying orbital period of the system. It is suggested that variations in the depth and duration of these events are caused by a bulge in the edge of the accretion disk, at the point where the gas stream impacts the disk. The mass losing star in this system is probably a low mass white dwarf. The spectrum of the dips indicates that the metallicity of the absorbing material is at least a factor 17 below solar values.

N82-15002/0 PC **A02**/MF **A01**
University Coll., Cardiff (Wales).
The 3.4 Micron Interstellar Absorption Feature and the Organic Composition of Interstellar Grains.
D. T. Wickramasinghe, D. A. Allen, F. Hoyle, and N. C. Wickramasinghe. Jun 80, 16p PREPRINT-61
Submitted for Publication.

No abstract available.

PB82-149089 Not available NTIS
National Bureau of Standards, Washington, DC.
First Detection of Nonflare Microwave Emission from the Coronae of Single Late-Type Dwarf Stars.
Final rept.,
D. D. Gary, and J. L. Linsky. Nov 81, 9p
Grant NGL-06-003-057
Pub. in Astrophysical Jnl. 250, p284-292, 1 Nov 81.

An observing program is reported with the VLA in its C configuration to detect microwave radiation from the coronae of nearby late-type dwarf stars which are not members of close binary systems and do not have large winds. Six stars, chosen on the basis of strong apparent X-ray flux, were observed during a 24 hour period, and two stars were detected.

PB82-152091 Not available NTIS
National Bureau of Standards, Washington, DC.
Formation of Protostars in Collapsing, Rotating, Turbulent Clouds,
O. Regev, and G. Shaviv. May 81, 16p
Pub. in Astrophysical Jnl. 245, n3 p934-959, 1 May 81.

Collapse and star formation processes in rotating turbulent interstellar gas clouds have been studied. For this purpose, numerical collapse calculations have been performed for a number of representative cases. These calculations have been carried out by a two-dimensional hydrodynamical computer code, which solves the equations of hydrodynamics explicitly, coupled to the Poisson equation. The importance of this work lies in the fact that a new theoretical model is proposed, in which a central protostar forms as a result of the collapse of a protostellar rotating cloud.

PB82-152109 Not available NTIS
National Bureau of Standards, Washington, DC.
The Effect of Diffusion on Asymptotic Branching Evolution,
D. Prialnik, G. Shaviv, and A. Kovetz. Jul 81, 11p
Pub. in Astrophysical Jnl. 247, p225-235, 1 Jul 81.

Evolution along the asymptotic branch leads to a configuration characterized by two burning shells that are close to each other and very thin. Under these circumstances, which involve steep composition gradients, encounters between charged particles of the stellar plasma lead to diffusion. The authors have studied the effect of diffusion on the asymptotic branch evolution of a 6 solar mass star mode. The most important conclusions are given.

RL-81-005 PC **A03**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Detailed Observations of NGC 4151 with IUE. Paper 1. Low-Dispersion Data Up to 1979 January.
M. V. Penston, A. Boksenberg, and G. E. Bromage. Jan 81, 30p
U.S. Sales Only.

This paper reports low-resolution ultraviolet-spectroscopic monitoring of NGC 4151 with IUE in the period 1978 February to 1979 January. Observations were made at 7 different epochs. Continuum points can be isolated in both long-wave (1950 to 3250 A) and, with some difficulty, short-wave (1150 to 1950 A) regions. 15 absorption features are identified and their equivalent widths measured. Some arise from metastable levels, some are variable, and others are stronger than can be accounted for by the interstellar media of our galaxy and of the NGC 4151 galaxy alone. Most arise in the nucleus of NGC 4151. Velocity variations in the absorption region are indicated by changing V/R ratios in the overall C IV feature. The Si IV lines are unsaturated and must therefore be broad. The lower limit to the absorbing column is much less than the X-ray column, but this latter amount could be present but escape detection if in the form of clouds with low-velocity dispersions. The strong emission lines include those seen in quasars; weaker features including some unidentified ones are also discussed. The intensities of the high-ionization emission lines are variable, as are the line widths of C IV. Most variable parameters vary in phase or anti-phase with the continuum and may be explained in terms of changing ionization conditions in the absorption and emission regions. (Atomindex citation 12:603513)

RRK-79-13 PC **A02**/MF **A01**
Hiroshima Univ., Takehara (Japan). Research Inst. for Theoretical Physics.
Canonical Approach to the Creation of Scalar Particles in the Chitre-Hartie Model-Universe.
H. Nariai. Jul 79, 5p
U.S. Sales Only.

The average number of created particle-pairs in the Chitre-Hartle model universe was obtained. The calculation starts from the fact that the Haukel functions in canonical expression are related to the Bessel functions. Since the universe under consideration becomes singular at t = 0, the value of mt must be larger than zero. It may be said that the time-dependent function in the Feynmann propagator is of positive frequency in the neighborhood of t = 0. The expression for this time-dependent function was obtained. The expression of amplitude was derived when a pair of particles is gravitationally created in the universe under consideration and detected later in the states specified by the solutions of the above mentioned time-dependent function. By using this amplitude, the average number of created particle-pairs can be calculated. The expression for the average number includes the physical energy of a particle-pair, the temperature and a measure of the chemical potential which vanishes in the case of a purely thermal law. (Atomindex citation 11:561003)

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A108 800/4 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Influence of Velocity Shear on the Rayleigh-Taylor Instability.
Memorandum rept.,
P. N. Guzdar, P. Satyanarayana, J. D. Huba, and S. L. Ossakow. 16 Dec 81, 27p Rept no. NRL-MR-4701

The influence of a transverse velocity shear on the Rayleigh-Taylor instability is investigated. It is found that a sheared velocity flow can substantially reduce the growth rate of the Rayleigh-Taylor instability in the short wavelength regime (i.e., $kL > 1$ where L is the scale length of the density inhomogeneity), and causes the growth rate to maximize at $kL < 1.0$. Applications of this result to ionospheric phenomena (equatorial spread F (ESF) and ionospheric plasma clouds) are discussed. In particular, the effect of shear could account for, at times, the 100's of km modulation observed on the bottomside of the ESF ionosphere and the km scale size wavelengths observed in barium cloud prompt striation phenomena. (Author)

AD-A108 806/1 PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Numerical Deconvolution to Obtain Cloud Signatures from Scattered Light Pulses.
Contractor's rept.,
James M. Supplee, and Dennis W. McGuire. Jul 81, 44p HDL-CR-81-100-1
Contract DAAG29-76-D-0100
Includes errata dated 18 Dec 81.

The optical return pulse resulting from light reflected from a cloud is given by a convolution of the transmitted pulse with the system range response and the cloud signature. To calculate the cloud signature when everything else is known requires a deconvolution. Since this deconvolution enhances noise, it is very difficult to get better resolution in the cloud signature than the 1 to 2 m that is immediately available by dividing the return pulse by the range response. (This relatively good resolution is available in this way because the transmitted pulse is fairly short, being about 6 ns FWHM.) It is shown that modestly improved resolution is possible if the signal to noise ratio in the return pulse is greater than about 100 to 1. (Author)

AD-A108 866/5 PC **A03**/MF **A01**
Boston Coll., Chestnut Hill, MA.
Inversion of Spire NO Data,
A. S. Zachor, R. D. Sharma, R. M. Nadile, and A. T. Stair, Jr. 20 Aug 81, 36p SCIENTIFIC-2, AFGL-TR-81-0325
Contract F19628-79-C-0139
Prepared in cooperation with Atmospheric Radiation Consultants, Inc., Acton, MA.

An algorithm was developed to invert spectrally resolved Earth limb radiance profiles. It is applicable in the nonequilibrium altitude regime for species/tangent heights that correspond to the optically thin condition. It was used to infer vertical distributions of temperature and excited NO density from data measured by SPIRE (the Spectral Infrared Rocket Experiment) in the NO fundamental band near 5.3 microns. The solution for excited NO density was used to compute atmospheric radiative cooling rates for the 5.3 microns band and the de-excitation rate constant k0 for the reaction NO + 0 yields NO + 0. The results are in good agreement with previously published values. (Author)

AD-A108 879/8 PC **A02**/MF **A01**
Scripps Institution of Oceanography, La Jolla, CA.
Spring and Fall Measurements of European Very Low Altitude Volume Scattering Coefficients.
Interim rept.,
Richard W. Johnson. Aug 81, 22p SIO-REF-81-33, SCIENTIFIC-17, AFGL-TR-81-0237
Contract F19628-78-C-0200
See also Rept. no. AFGL-TR-81-0154, AD-A106 363.

This report presents measurements of atmospheric volume scattering coefficients collected during twenty-five low altitude flights made mostly during the Spring and Fall seasons of 1976 and 1977 at four different European locations. The measurements were conducted during an instrumented aircraft's final approach and landing at its staging airbase. The measurements were made using a pseudo-photopic spectral response and thus are suitable for comparison with data associated with standard visual determinations of airfield visibility. The data illustrate that in twenty-two of twenty-five cases, there was little or no significant variation in the value of scattering coefficient as the aircraft approached the surface from an altitude of several hundred meters. (Author)

AD-A108 914/3 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Observations of Ice Particles in Clear Air,
Scientific rept.,
Arnold A. Barnes, Jr. 14 Oct 80, 7p Rept no. AFGL-TR-81-0347
Pub. in Jnl. de Researches Atmospheriques, v14 n3-4 p311-315 1980. Abstract in French.

No abstract available.

AD-A109 063/8 PC **A02**/MF **A01**
Emmanuel Coll., Boston, MA. Physics Research Div.
DMSP/F2 Electron Observations of Equatorward Auroral Boundaries and Their Relationship to the Solar Wind Velocity and the North-South Component of the Interplanetary Magnetic Field,
D. A. Hardy, W. J. Burke, M. S. Gussenhoven, N. Heinemann, and E. Holeman. 23 Mar 81, 16p AFGL-TR-81-0348
Contracts F19628-79-C-0102, F19628-81-K-0032
Pub. in Jnl. of Geophysical Research, v86 nA12 p9961-9974, 1 Nov 81.

No abstract available.

AD-A109 267/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Airborne Measurements of Infrared Atmospheric Radiance and Sky Noise.
Journal article,
Donald E. Lencioni, Daniel L. Mooney, William E. Bicknell, and William J. Scouler. 1981, 13p MS-5577, ESD-TR-81-311
Contract F19628-80-C-0002
Pub. in SPIE, v280 p77-88 1981.

No abstract available.

AD-A109 306/1 PC **A03**/MF **A01**
Army Missile Command, Redstone Arsenal, AL. Research Directorate.
A Survey of Atmospheric Turbulence Characteristics.
Technical rept.,
Dorothy A. Stewart. 19 Aug 81, 35p Rept no. DRSMI-RR-81-6

This report reviews the literature on atmospheric turbulence in the planetary boundary layer, with the main emphasis on the lowest tens of meters. A table summarizes 26 references which discuss variations in intensity of turbulence. This intensity tends to be greater over rough surfaces than over smooth surfaces. Intensity of turbulence normally decreases when either altitude or atmospheric stability increases. High wind speeds are more likely to be associated with nearly neutral stability than with very stable or very unstable conditions. This report also includes a discussion of the autocorrelation function for the three components of the wind vector. (Author)

N82-14550/9 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Spectral Atmospheric Observations at Nantucket Island, May 7-14, 1981.
T. A. Talay, and L. R. Poole. Nov 81, 56p NASA-TM-83196

An experiment was conducted by the National Langley Research Center to measure atmospheric optical conditions using a 10-channel solar spectral photometer system. This experiment was part of a larger series of multidisciplinary experiments performed in the area of Nantucket Shoals aimed at studying the dynamics of phytoplankton production processes. Analysis of the collected atmospheric data yield total and aerosol optical depths, transmittances, normalized sky radiance distributions, and total and sky irradiances. Results of this analysis may aid in atmospheric corrections of remote sensor data obtained by several sensors overflying the Nantucket Shoals area. Recommendations are presented concerning future experiments using the described solar photometer system and calibration and operational deficiencies uncovered during the experiment.

N82-14691/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Stratospheric Aerosols.
M. P. Mccormick. Nov 81, 20p NASA-TM-83217

The current state of information on stratospheric aerosols is reviewed. Aerosol properties such as size, size distribution, composition, refractive index, number density, extinction, optical depth, and single scattering albedo are considered and generalized as much as possible to be representative of the global aerosol in times of volcanic and nonvolcanic (background) periods. Data are presented that show the global distribution of stratospheric aerosols as measured by the stratospheric aerosol and gas experiment (SAGE) satellite system for background and volcanic (post-Mount St. Helens) conditions. In addition, lidar and dustsonde data are presented that show the changes in stratospheric aerosol over an 8-year period.

N82-14694/5 PC **A02**/MF **A01**
Bonn Univ. (Germany, F.R.). Inst. fuer Astrophysik and Extraterrestische Forschung.
On the Identification of Planetary-Scale Waves During Disturbed Conditions.
G. W. Proelss. 1981, 13p ISSN-0340-9821, REPT-94
In English; German Abstract.

Thermospheric density variations previously interpreted as propagating gravity waves are investigated. These variations are primarily spatial in nature and are attributed to the quasi-stationary daytime geomagnetic activity effect.

N82-14709/1 PC **A04**/MF **A01**
Technische Univ., Brunswick (Germany, F.R.).
Sounding Rocket Program Magnetosphere: The Search Coil Magnetometer Experiment in the Substorm Phenomena Payload.
Final Report, Jun. 1980.
G. Dehmel, and B. Theile. Feb 81, 51p BMFT-FB-W-81-010, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Single axis search coil magnetometers were used in order to study plasma waves in the magnetosphere. The instruments are sensitive to magnetic field variations in the frequency range from 100 Hz to 5.2 kHz and complement the electromagnetic wave detector measurements. The sensor consists of a coil, a micrometal core and a preamplifier. Analog amplifiers and filters are contained in the main electronics package. Electromagnetic interferences during payload tests are discussed. All four flights were successful, even though interferences during activation of the attitude control system deteriorated some data. The data are presented as amplitude-time diagrams and as spectra in the frequency range 200 Hz to 5 kHz (100 Hz bandwidth).

N82-14710/9 PC **A06**/MF **A01**
Centre de Recherches en Physique de l'Environnement Terrestre et Planetaire, Orleans (France).
Experimental Study of Instabilities and Motion of a Streaming Ionospheric Plasma in the Polar Zone Etude Experimentale des Instabilites et Mouvements de Derive du Plasma Ionospherique en Zone Polaire.
J. Pignard. Sep 79, 119p CRPE-NT-78
Text in French.

A space environment simulator was used in order to show the effect of plasma drift rate on the transfer impedance of a quadruple HF probe. Results allow for interpretation of the self oscillation frequency shift between the interferometric self oscillating probes onboard the sounding rocket experiment IPOCAMP 2. Data processing for the IPOCAMP 2 experiment, i.e. measurement of the electron density and of the continuous (0 to 20 Hz) and alternating (10 to 200 Hz) electric fields, is explained. Physical parameters of the polar ionosphere were determined. Measurements contribute to a geophysical model of double band plasma instability observed in the E region of the auroral zone.

N82-14714/1 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Measurement of Characteristics of Lightning at High Altitudes.
Final Report.
M. Coquelet, and D. Gall. Dec 81, 80p NASA-TM-76669
Contract NASW-3541
Transl. Into English of 'Mesure des Caracteristiques de la Foudre en Altitude" Test No. 76/650000 p.4. Final Report, Toulouse, May 1979 74 p. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prepared by Ceat.

New development in aeronautical technology -- the use of composite materials, new electronic components, electric flight controls -- have made aircraft potentially more and more vulnerable to the effects of lightning. In-flight tests were conducted to evaluate the current in a bolt of lightning, to measure voltage surge in the onboard circuitry and in certain pieces of equipment, and to document the relationship lightning bolt current and the voltage surge.

N82-14924/6 PC **A04**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
Statistical Measurement of the 1978 Lidar Measurements.
C. W. Lamberts. Nov 80, 64p PHL-1980-41, TDCK-75026
Contract A78/KL/121
Document Includes a Microfiche Supplement.

Analysis for combined lidar aerosol and meteorological measurements are presented. The data are used for the remote deduction of atmospheric parameters. Analytical relations are based on statistics, not on physical laws. Results show that wind direction has an important influence on visibility, backscatter, and extinction. Extinction is difficult to calculate, especially when visibility is good, so a large range of measured extinction is shown. An increasing spread in backscatter is present at high visibility due to aerosol distribution properties. Aerosol properties can be deduced from meteorological and/or lidar measurement.

N82-14998/0 PC **A02**/MF **A01**
Royal Observatory, Edinburgh (Scotland).
Optical Performance Data for the UK Infrared Telescope; Atmospheric Seeing Effects in the Infrared.
C. M. Humphries, and T. E. Purkins. 1 Dec 80, 25p
UKIRT-16, ISSN-0260-9983

Aperture diffraction modulation transfer functions (MTF) were calculated at wavelengths from 0.5 to 10 microns, for a primary aperture of 3.8m, and a secondary diameter of 0.95m. Measured MTF at 0.5 to 4 microns for UKIRT optics is compared with aperture diffraction MTF, including the effect of average seeing conditions. Wavelength dependent MTF under good atmospheric seeing conditions, i.e. 0.5, 1, and 2 arcsec seeing, are presented with point spread functions. Performance matches predictions. The theory of MTF is introduced. It measures the modulation or contrast of features in the exit pupil at various spatial frequencies and expresses them in linear or angular separation distances.

PB82-143363 PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
Cloud Water Chemistry and the Production of Sulfates in Clouds.
Journal article,
Dean A. Hegg, and Peter V. Hobbs. 23 Dec 80, 10p
CONTRIB-559, EPA-600/J-81-473
Contract NAS8-33148, Grant EPA-R-005263
Pub. in Atmospheric Environment, v15 n9 p1597-1604 1981.

Measurements are presented of the pH and ionic content of water collected in clouds over Western Washington and the Los Angeles Basin. Evidence for sulfate production in some of the clouds is presented. Not all of the sulfur in the cloud water was in the form of sulfate. However, the measurements indicate that the production of sulfate in clouds is of considerable significance in the atmosphere. Comparison of field measurements with model results show reasonable agreement and suggest that the production of sulfate in cloud water is a consequence of more than one conversion mechanism.

PB82-862830 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ozonosphere. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 210p
Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography covers the properties and behavior of the ozonosphere with respect to its formation, fluctuations, and depletion. Natural and anthropogenic factors influencing ozonospheric reactions and composition are considered. Some attention is given to modeling. (Contains 215 citations fully indexed and includes a title list.)

4B. Meteorology

AD-A108 760/0 PC **A03**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
12828F Lance, Missile Number 5336, Round Number 368-MSL, 2 October 1981.
Meteorological data rept.,
Donald C. Keller. Nov 81, 35p Rept no. ERADCOM/ASL-DR-1209

Meteorological data gathered for the launching of the 12828F Lance, Missile No. 5336 presented in tabular form. (Author)

AD-A108 776/6 PC **A03**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
12829A LANCE Missile Number 2518, Round Number 369DST. 2 November 1981.
Meteorological data rept.,
Donald C. Keller. 2 Nov 81, 36p Rept no. ERADCOM/ASL-DR-1210

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods: Surface: Standard surface observations to include pressure, temperature (C), relative humidity, dew point (C), density (gm/cu m), wind speed and direction, and cloud cover were made at the LC-33 Met Site at T-O minutes; and Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room. Upper Air: Low level wind data were obtained from NIKE-HERC Radar Tracked pibot balloon, and Air structure data (rawinsonde) were collected at the following Met Sites. Data were collected from surface to high as possible in 500-feet increments.

AD-A108 881/4 PC **A05**/MF **A01**
Wisconsin Univ.-Madison. Space Science and Engineering Center.
The Development and Testing of Methods to Infer Midlatitude Precipitation Intensity from Geosynchronous Satellite Infrared Data,
John V. Zapotocny, Donald R. Johnson, and Thomas M. Whittaker. 31 Jul 81, 90p SCIENTIFIC-3, AFGL-TR-81-0252
Contract F19628-78-C-0137

In an attempt to aid development of simple techniques applicable in middle latitudes, this study addresses the inference of precipitation intensity and its temporal change associated with imbedded convective activity at a location in areas of continuous stratiform precipitation from Geosynchronous Operational Environmental Satellite (GOES) IR digital data. Imbedded convective activity is easily identified in high resolution visible GOES imagery if high cloud layers are not present to obscure the convection. At low sun angles with the shadowing effect of the convective towers, details of these convective areas are especially enhanced. However, with the need for these methods to be applicable during both daytime and nighttime hours, only the IR 11 micron channel data were used in this study which was based on several synoptic cases. In each of the cases examined, visible and IR imagery and loops were used to help pinpoint optimum areas for study.

AD-A109 010/9 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Snowfall Rate Obtained from Radar Reflectivity within a 50KM Range,
Roland J. Boucher. 1981, 6p Rept no. AFGL-TR-81-0342
Pub. in Preprint Volume, Conference on Radar Meteorology (20th), 30 Nov-3 Dec 81, Boston, MA, p271-275.

No abstract available.

AD-A109 013/3 Not available NTIS
Florida State Univ., Tallahassee. Mesoscale Air-Sea Interaction Group.
Interannual Variability of the Equatorial Pacific in the 1960's,
Antonio J. Busalacchi, and James J. O'Brien. 23 Apr 81, 7p
Grant NSF-ATM79-20485
Pub. in Jnl. of Geophysical Research, v86 nC11 p10901-10907, 20 Nov 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 056/2 PC **A03**/MF **A01**
Cornell Univ., Ithaca, NY. School of Electrical Engineering.
Report on the Analysis of Data from the NOAA/Alaskan MST Radar System.
Interim rept.,
M. F. Larsen, M. C. Kelley, and D. T. Farley. Nov 81, 42p AFOSR-TR-81-0859
Grant AFOSR-80-0020

During this period the investigation of mesoscale eddy spectra was completed as well as a study of objective analysis schemes using geostrophic wind adjustments. Both depend upon the continuous data of the NOAA MST radar at Poker Flat, Alaska. The atmospheric power spectral studies revealed a k to the minus 5/3 inertial subrange at time scales of hours. The implication in this essentially two dimensional eddy regime is a source of energy existing at spatial scales of less than 100 km, propagating energy up the spectrum toward lower wavenumbers. At smaller scales, in the fully 3-d turbulent spectrum, the classic Kolmogorov inertial spectrum is found with energy cascading towards smaller scales. Again, a source of energy is suggested on the scale of 10-100 km. The candidate is convection. In the study of objective analysis techniques, Cressman, and Gandin and other approaches are analyzed using the continuous radar data record. No significant differences were found between the Cressman and Gandin schemes. Knowing the character of the radar data with respect to these well-known analyses now permits comparison to more sophisticated and less trivial techniques and may lead to suggestions for entirely new concepts. (Author)

AD-A109 080/2 PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Synoptic Meteorology During the Snow-One Field Experiment.
Special rept.,
Michael A. Bilello. Nov 81, 60p Rept no. CRREL-SR-81-27

The daily atmospheric pressure systems and weather fronts that traversed the northeastern United States during the SNOW-ONE Field Experiment from 11 January through 20 February 1981 are summarized. This experiment is the first in a planned series of measurements to study the influence of atmospheric obscurants on electro-optical system performance. The analysis of the large-scale synoptic patterns that developed during the field test period constitutes a critical component of the research program. The weather during the measurement period included nine new daily high temperature records. January was one of the driest and February was one of the wettest ever observed. These conditions were caused in part by two high pressure cells and two major low pressure systems that crossed the region. One of these lows brought warm air and heavy rain to New England, and the other produced significant snowfall in northern Vermont.

AD-A109 258/4 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
The Shape of Raindrop Spectra for Different Situations and Averaging Periods,
V. G. Plank, R. O. Berthel, and L. V. Delgado. 9 Oct 80, 11p Rept no. AFGL-TR-81-0353
Pub. in Jnl. de Recherches Atmospheriques, v14 n3-4 p301-309 1980. Abstract in French.

No abstract available.

AD-A109 325/1 PC **A04**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Specification of Cloud Amount over Local Areas from GOES Visual Imagery.
Environmental research papers,

Thomas J. Keegan, and Michael Niedzielski. 28 May 81, 60p Rept nos. AFGL-TR-81-0153, AFGL-ERP-743

Albedos derived from GOES visual imagery data are compared with the cloud cover reported at seven sites in the northeastern United States in the spring through autumn of 1977 and 1978. The data sample was closely edited to remove all cases containing unexplainable inconsistencies between the satellite and surface data. Statistics were generated for the aggregate of stations for spring/summer and autumn periods separately, as well as the two years separately. The seasonal data were further divided into those cases that contained predominantly ice crystal clouds or water clouds. The characteristics of the satellite data were computed for a 9 by 9 one-mile pixel box and were the average, maximum and minimum albedos, the range of albedo, and the texture. Detailed attention was given to the relationship between average albedo and cloud amounts. Equations were generated for each station for each year for the water droplet clouds during the spring/summer season. There were not sufficient cases to do the same for the autumn of the ice crystal cloud cases. There is a logical, consistent variation in the equations from station to station despite noisy data and a serious shortage of data throughout most of the scattered and broken cloud cover ranges. A multivariate analysis including infrared characteristics is indicated. (Author)

AD-A109 335/0 PC **A02**/MF **A01**
Naval Oceanography Command Center/Joint Typhoon Warning Center, FPO San Francisco 96630.
Forecasting Intense Tropical Cyclones Using 700-mb Equivalent Potential Temperature and Central Sea-Level Pressure.
Technical note,
George M. Dunnavan. Aug 81, 15p Rept no. NOCC/JTWC-TN-81-1

Sikora (1976), et al., suggests that the equivalent potential temperature at 700 mb in a developing tropical cyclone is an excellent parameter to measure the total thermodynamic energy of the tropical cyclone at a particular time. He further suggests that abnormally high values of equivalent potential temperature (> or = 370 K) can herald a period of subsequent explosive deepening. This note expands on that idea to propose a technique for forecasting the development of intense tropical cyclones (minimum sea-level pressure <925 mb) based on the relationship of the total thermodynamic field, as measured by the tropical cyclone's central 700-mb equivalent potential temperature, and the kinematic field, as measured by the tropical cyclone's central sea-level pressure. One hundred seven tropical cyclones which occurred in the north Western Pacific and north Central Pacific Ocean were evaluated using 700-mb temperature, 700-mb dewpoint and sea-level pressure data which were available from past Annual Typhoon Reports (1975-1980). These data were used to develop a forecast technique whereby the tropical cyclone forecaster may anticipate significant development in a tropical cyclone by monitoring the central sea-level pressure and 700-mb equivalent potential temperature provided by aircraft reconnaissance. (Author)

DE82000956 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Numerical Wind-Speed Simulation Model.
J. V. Ramsdell, G. F. Athey, and M. Y. Ballinger. Sep 81, 88p PNL-3864
Contract AC06-76RL01830

A relatively simple stochastic model for simulating wind speed time series that can be used as an alternative to time series from representative locations is described in this report. The model incorporates systematic seasonal variation of the mean wind, its standard deviation, and the correlation speeds. It also incorporates systematic diurnal variation of the mean speed and standard deviation. To demonstrate the model capabilities, simulations were made using model parameters derived from data collected at the Hanford Meteorology Station, and results of analysis of simulated and actual data were compared. (ERA citation 06:034668)

N82-14493/2 PC **A08**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
Silicon Dew-Point Sensor for Accurate Humidity Measurement Systems.
Ph.D. Thesis.
P. P. L. Restien. 10 Jun 81, 157p
In English; Dutch Abstract.

The design and properties of an electronic humidity measuring system for the determination of the water-vapor content in air or other gases are described. The system is based on an integrated silicon dew-point sensor. After a discussion of the increasing scope of hygrometry in a variety of application fields in science, engineering and production, a review is given of humidity measuring methods. The most promising measuring method appears to be the determination of the dew-point temperature. It is shown that the integreted circuit technology can be applied successfully for the realization of accurate dew-point sensors. Three types of integrated dew-point sensors made with a standard IC-process or compatible technology are described. Based on an error analysis, a continuously operating dew-point hygrometer system was designed. This system consist of, beside the designed integrated sensor, a special control system for thermoelectrically controlled cooling, and data processing unit for selected presentation of the most important humidity quantities.

N82-14549/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
A Simulation Study of the Recession Coefficient for Antecedent Precipitation Index.
B. J. Choudhury, and B. J. Blanchard. Nov 81, 25p NASA-TM-83860
Submitted for Publication.

The antecedent precipitation index (API) is a useful indicator of soil moisture conditions for watershed runoff calculations and recent attempts to correlate this index with spaceborne microwave observations have been fairly successful. It is shown that the prognostic equation for soil moisture used in some of the atmospheric general circulation models together with Thornthwaite-Mather parameterization of actual evapotranspiration leads to API equations. The recession coefficient for API is found to depend on climatic factors through potential evapotranspiration and on soil texture through the field capacity and the permanent wilting point. Climatological data for Wisconsin together with a recently developed model for global isolation are used to simulate the annual trend of the recession coefficient. Good quantitative agreement is shown with the observed trend at Fennimore and Colby watersheds in Wisconsin. It is suggested that API could be a unifying vocabulary for watershed and atmospheric general circulation modelars.

N82-14713/3 PC **A03**/MF **A01**
Finnish Meteorological Inst., Helsinki.
Lightning Flash Counter Measurements in Finland During 1978 and 1979.
L. Laitinen. 1981, 31p REPT-86, ISBN-951-697-135-0
In Finnish; English Summary.

Lightning flash counter measurements in Finland are given. Transistorized counters were placed at weather stations throughout the country with the aim of finding the best measurement site for every counter in order to make the results as comparable as possible. Data are presented in the form of tables, graphs, and maps.

N82-14716/6 PC **A19**/MF **A01**
European Space Agency, Paris (France).
Nowcasting: Mesoscale Observations and Short-Range Prediction.
B. Battrick, and J. Mort. Jun 81, 427p ESA-SP-165, ISSN-0379-6566
Symp. Held in Hamburg, 25-28 Aug. 1981; Sponsored by International Commission on Cloud Physics, International Association of Meteorology and Atmospheric Physics, Wmo and Cospar. Original Contains Color Illustrations.

No abstract available.

N82-14784/4 PC **A02**/MF **A01**
Institut Royal Meteorologique de Belgique, Brussels.
A Statistical Model of Wind Distribution in Force and in Direction: Application to Uccle (Brussels) Data and Validity of the Model for Belgium UN Modele Statistique de la Repartition des Vents en Force et en Direction: Application aux Donnees d'Uccle (Bruxelles) et Validite du Modele pour la Belgique.
R. Sneyers. 1980, 21p PUBL-SER-B-107
In French; English Summary. Presented at 16TH Congr. De Meteorol. Alpine, Aix-les-Bains, France, Sep. 1980.

The adjustment of a statistical model of wind so that the entire set of empirical data obtained for each of the 12 months of the year can be taken into account was studied. The resultant model can be used to determine, for whatever time of year and for whatever wind direction, the probability of the associated wind of given velocity. The distribution at Uccle of the wind speeds is represented through gamma distributions, the shape parameter of which can be considered independent of both wind direction and time of year. The mean speed thus fully characterizes each distribution. The mean speed is shown as a periodic function of the time of year as well as of the wind direction.

N82-14785/1 PC **A03**/MF **A01**
Institut Royal Meteorologique de Belgique, Brussels.
On the Meteorological Meaning of the Terms Gust, Storm, and Hurricane sur le Sens Meteorologique des Termes Coup de Vent, Tempete et Ouragan.
L. Dufour. 1981, 27p PUBL-SER-B-109
Text in French.

Meteorological terms, associated with the Beaufort anemometrical scale, are considered. Meteorological connotations and lexicological references are cited. The terms are defined as to wind velocity calculated over 10 min intervals, i.e. gust: 34 to 40 knots; storm: 48 to 55 knots; hurricane: ch110 64 knots.

PB82-143306 PC **A02**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Meteorology.
Satellite Estimation of the Surface Energy Balance, Moisture Availability and Thermal Inertia.
Journal article,
Toby N. Carlson, Joseph K. Dodd, Stanley G. Benjamin, and James N. Cooper. 23 Aug 80, 13p EPA-600/J-81-478
Pub. in Jnl. of Applied Meteorology, v20 n1 p67-87 Jan 81.

A method for inferring the distribution of surface heat and evaporative fluxes and the ground moisture availability and thermal inertial (ground conductive capacity) is used to analyze two urbanized areas, Los Angeles and St. Louis. The technique employs infrared satellite temperature measurements in conjunction with a one-dimensional boundary-layer model. Results show that there is a marked reduction of evaporation and moisture availability and a corresponding elevation of sensible heat flux over urbanized areas and over cropped areas with low vegetative cover.

PB82-148719 PC **A03**/MF **A01**
National Weather Service, Silver Spring, MD.
Watch/Warning Verification: Flash Flood, Winter Storm and High Wind (1980).
Technical memo.,
A. Kristine Campbell. Sep 81, 42p NOAA-TM-NWS-FCST-26, NOAA-81103007

To develop a better measure of watch/warning forecast performance, Weather Service forecast offices have been providing national headquarters with verification logs on flash floods, winter storms and high winds since January 1979. These logs consist of issue time, valid time, lead time, area, verification for watches and warnings, and events that occur in the absence of a watch or warning. A total of 448 flash flood, 216 winter weather and 117 high wind events were reported on the logs in 1980.

PB82-148974 PC **A04**/MF **A01**
Illinois State Water Survey Div., Champaign.
Rainfall Prediction-Measurement Systems and Rainfall Design Information for Urban Areas.
Stanley A. Changnon, Jr., Floyd A. Huff, John L. Vogel, David A. Brunkow, and Donald W. Staggs. 1980, 71p ISWS/CIR-146/80

A new form of rainfall prediction and monitoring system, based on modern weather radar and joint computer systems, can be effective in metropolitan areas that require advance notice of rainfall in order to manage storm or combined sewer systems. The potential of such a system was proved in a 1979 demonstration project conducted by the Illinois State Water Survey and the Metropolitan Sanitary District of Greater Chicago (MSDGC). The demonstration project capped a 4-year project involving the study of rainfall, including its real-time measurement and prediction over and around the Chicago Metropolitan Area. A major aim of the project was to provide information and guidance to those concerned with water re-

sources management in metropolitan areas. This report helps to fulfill that goal by providing material concerning real-time rainfall prediction-monitoring systems that can be considered for use in urban areas, and hydrometeorological information relevant to various rainfall design considerations in urban areas.

PB82-150889 PC **A10**/MF **A01**
Water and Power Resources Service, Denver, CO.
Project Skywater Data Inventory, 1980 HIPLEX Season. High Plains Cooperative Program.
Dec 80, 213p
See also PB80-189988.

This report contains an inventory of all data that were collected in association with HIPLEX (High Plains Cooperative Program), a weather modification research project in spring and summer convective cloud seeding from May through July 1980 in Montana.

PB82-153081 PC **E03**/MF **E03**
National Maritime Inst., Feltham (England).
Wave Climate Synthesis for Engineering Purposes - A Paper Presented to a Meeting of the Society for Underwater Technology on 17 May 1979,
N. Hogben. c1981, 44p NMI/R-103

'Wave climate synthesis' can, in this context, be regarded as the process of translating primary source data from meteorological and oceanographic agencies into models of wave climate suitable for engineering applications. Broadly, the term relates to methods for deriving wave statistics from wind statistics--important in many practical cases when only wind statistics are available and where wave data exists but covers an insufficient number of years to provide a reliable basis for defining the long-term climate and estimating the corresponding extreme conditions. The term is also used to describe various techniques for translating existing stocks of simple wave or wind statistics into relatively sophisticated models of wave climate. The subject matter of the presentation and of subsequent discussions should be of interest to engineering users of wave climate data--the offshore industry and related civil engineering interests, the shipping industry and the wave power community--as well as to meteorological and oceanographic sectors.

PB82-154006 PC **A02**/MF **A01**
National Weather Service, Fort Worth, TX. Southern Region.
Some Empirical Rules for Forecasting Fog and Stratus Over Northern Florida, Southern Georgia and Adjacent Coastal Waters.
Technical memo.,
Emmett L. Ricks. Aug 81, 15p NOAA-TM-NWS-SR-104, NOAA-81111608

Strong low-level winds, especially strong vertical wind shear, generate and maintain enough mixing below the subsidence inversion over southern Georgia and northern Florida to counteract, or inhibit, low stratus and fog formation. Weaker northeast and east winds favor low stratus and fog formation over southern Georgia and northern Florida when the trajectory is from the Atlantic coast.

PB82-154311 Not available NTIS
National Bureau of Standards, Washington, DC.
Wind Speed - Damage Correlation in Hurricane Frederic.
Final rept.,
K. C. Mehta, J. E. Minor, R. D. Marshall, and T. A. Reinhold. 1981, 14p
Pub. in Proceedings of American Society of Civil Engineers Convention and Exposition, Held in St. Louis, MO. on October 26-30, 1981 14p Nov 81.

Damage to buildings and other structures caused by Hurricane Frederic's winds is reviewed and classified by level of engineering design and by range of maximum wind speed. Observations concerning the performance of buildings and structures are grouped according to whether the buildings and structures are fully engineered, pre-engineered, marginally engineered, or non-engineered. A major emphasis is placed on estimating wind speeds, at sites of damage observations, from anemometer data. Wind speed data is converted to equivalent maximum fastest-mile wind speeds at elevations of 10 meters over open terrain. Performance observations are further correlated with fastest-mile wind speed ranges of 70-85 mph, 85-100 mph, and 100-110 mph. These observations indicate that significant damage did not occur until wind speeds reached or exceeded design values.

PB82-154436 PC **A03**/MF **A01**
Illinois State Water Survey Div., Champaign.
Evaluations of Illinois Weather Modification Projects of 1976-1980: A Summary,
Stanley A. Changnon, Jr., and Chin Fei Hsu. 1981, 35p ISWS/CIR-148/81

This report summarizes the key results of statistical and meteorological assessments of five summer weather modification projects in Illinois. The projects assessed were among eight one-summer weather modification projects in Illinois during 1976-1980, each of which attempted to increase summer rainfall through cloud seeding with silver iodide. All the projects involved meteorological forecasting and direction of the cloud seeding, aircraft for cloud base and mid-cloud seeding, and a weather radar for operations and data collection.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A108 798/0 PC **A04**/MF **A01**
MITRE Corp., Bedford, MA.
RIW Workshop Report.
Technical rept.,
Walter P. Crossley, and Sidney A. Greenberg. Nov 81, 56p MTR-8255, ESD-TR-81-257
Contract F19628-82-C-0001

A reliability improvement warranty (RIW) workshop was convened on 9-10- December 1980 at the MITRE Corporation, Bedford, Mass., to explore the feasibility of RIW for current and future production JTIDS (Joint Tactical Information Distribution System) contracts. In particular, RIW suitability for the Class I JTIDS production buy was discussed. The concensus of the group was that RIW is not appropriate for the Class 1 production buy, but that it can be useful on other programs including Class 2 JTIDS if certain conditions are met and the RIW contract is tailored to the program. (Author)

AD-A108 925/9 PC **A09**/MF **A01**
General Electric Co., Santa Barbara, CA. TEMPO.
Planning Study to Establish DoD Manufacturing Technology Information Analysis Center.
Final technical rept. May 80-Jan 81, Jan 81, 191p Rept no. GE80TMP-43
Contract DAAG46-80-C-0026

Based on the results of the planning study, it is recommended that the DoD sponsor and initiate administrative procedures to establish an MTIAC within 2 years with the mission of improving the diffusion of DoD Manufacturing Technology (MT) program results by serving as a focal point between defense-related industries and the Military Services. It is also recommended that the MTIAC be: (1) Operated and staffed by one of several qualified nongovernment, DoD contractor organizations; (2) Administered by DLA and technically monitored by a Military Services agency such as AMMRC; and (3) Initially funded (by OSD and the Military Services) at an annual level ranging from $400,000 to $700,000 with a growth not to exceed $1,000,000 in 5 years.

AD-A108 932/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
U.S. Airlift Requirements Should be Satisfied Through Competition.
18 Dec 81, 4p Rept no. GAO/MASAD-82-11

The review of the Air Force's C-X airlift aircraft program shows that the Department of Defense may not solicit the maximum practicable competition if an airlifter other than the C-X is to be selected to meet U.S. airlift requirements. Failure to do so could result in sole-source awards for multibillion dollar systems without permitting industry the opportunity to make proposals for an aircraft with different size and capabilities than the C-X. Realizing there are trade-offs, every effort should be made to obtain the best mix of modern, capable, and economical systems possible since they will probably be in the Air Force inventory well into the next century.

AD-A108 933/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Actions by the Bonneville Power Administration to Implement the Long-Term Contracting Provisions of P.L. 96-501.
4 Sep 81, 14p Rept no. GAO/EMD-81-140

P.L. 96-501, which provides for regional electric power planning and development in the Pacific Northwest, emphasizes the use of conservation and renewable resources, preservation of the region's fish and wildlife, and protection of the environment. The Act requires the Bonneville Power Administration (BPA) to keep the cognizant congressional committees fully and currently informed of actions taken and to be taken by the Administrator under this Act. Based on limited review, it appears that BPA has latitude in how it could implement section 5(g)(1). The statute says that, within 9 months of the Act's effective date, BPA has to (1) begin necessary negotiations which would lead to initial long-term contracts and (2) make valid offers to its customers. Under section 5(g)(1), BPA had several options it could choose regarding offers and negotiations. BPA made the management decision to enter into negotiations for more than 8 months in an effort to draft contracts based on information obtained during the negotiating process. While the Act allows for negotiations for a period of 1 year after the offering of contracts, it appears that BPA management decided it would be better to complete as much of the negotiation phase as possible prior to offering the contracts.

AD-A109 007/5 PC **A08**/MF **A01**
Office of the Chief of Staff (Army), Washington, DC. Management Directorate.
The Army Study Program, FY 1982.
1981, 161p

This FY-82 study program includes command and agency agendas for the period. These studies include a broad class of intellectual activity characterized by the application of the tools of operational or systems analysis to Army problems. The studies are analytical examinations to assist Army decisionmakers. They develop assessments, alternatives, recommendations, or supporting methodologies. They contribute to greater understanding of relevant issues and lead to conclusions and recommendations for use by decisionmakers. The central purpose of each study is to support action when there is a reasonable expectation of a significant contribution to decisionmaking or policy development.

AD-A109 030/7 PC **A04**/MF **A01**
Decisions and Designs, Inc., McLean, VA.
Research on Management for Simulation Programs in the U.S. Navy.
Final rept.,
Thomas R. Rhees, Kenneth P. Kuskey, and Robert N. Kraft. Nov 81, 68p Rept no. PR-81-27-330
Contract N00014-81-C-0466
See also AD-A103 089.

New computer simulation technology makes it possible to simulate naval warfare more effectively and on a more widespread basis. This technology is a very useful and economic way to enhance naval warfare training and to develop and evaluate tactics. This report addresses the management of simulation programs, based upon research into the applications of computer-assisted simulations and relevant directives on management. It is also based upon a unique conference with representatives of Navy activities involved in simulation matters to investigate management options. The Navy has long recognized the benefits of simulators in training. Advances in computer and simulation technology now promise to increase the sophistication and widen the use of simulations throughout the Navy. In addition, there is an emerging requirement for tactical simulation capabilities. The investment in these emerging uses of simulation is expected to be a

large one; however, the possibility of technical, programmatic, and logistics problems exists. This report discusses representative problem areas and identifies the directions in which the Navy must move to establish and carry out simulation programs which can achieve maximum benefit and avoid possible problems. (Author)

AD-A109 148/7 PC **A03**/MF **A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
An Application of Mathematical Programming to Assess Managerial Efficiency in the Houston Independent School District.
Research rept.,
A. Bessent, W. Bessent, J. Kennington, and B. Reagan. Nov 81, 39p Rept no. CCS-373
Contracts N00014-81-C-0236, N00014-75-C-0569
Prepared in cooperation with Southern Methodist Univ., Dallas, TX. under Grant AFOSR-77-3151. Sponsored in part by Grant NSF-SOC76-15876.

A school may be viewed as an enterprise in which the professional staff provide the operating conditions for converting quantifiable resources or inputs into pupil learning (outputs). The resources are determined by budgets, teacher assignments, and student assignments while learning is determined by various outputs scored according to standardized tests such as the Iowa Test of Basic Skills. Following the work of Charnes, Cooper, and Rhodes, we use a ratio definition of efficiency which takes account of all outputs and inputs without requiring a priori specification of weights. Instead a series of mathematical programs are applied to determine 'virtual multipliers' from actual data which yield the values that can be regarded as the 'most favorable weights' for each school being evaluated. If the resulting optimum virtual multipliers for a given school yields an efficiency ratio of one, then that school is said to be efficient. If the ratio is less than one then that school is said to be inefficient relative to the other schools in the analysis. The ratio is also accorded operational significance--it is not merely an index number-- so that the resulting values and the associated virtual multipliers make it possible to locate where improvements may be made along with their relative magnitudes. This analysis was applied to 167 elementary schools in the Houston Independent School District.

AD-A109 149/5 PC **A02**/MF **A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
Preliminary Report 1 on Rapid Response Algorithms for Optimizing the Utilization of Human Resources in Flight Crews: Scheduling Aircrews to Aircrafts.
Research rept.,
R. Armstrong, A. Charnes, M. Kress, and S. Samn. Jul 81, 16p Rept no. CCS-400
Prepared in cooperation with Texas A and M Research Foundation, College Station under Contract L100018.

Consider an airlift operation which consists of several routes, each having missions which are subject to given time schedules. The aircraft are manned with aircrews that are required to rest for a certain period of time after each leg of a mission. A mission may be continued whenever a rested aircrew is available at the location. Given the number of missions that are needed to be flown on the different routes, and given the schedule timetable that is associated with those missions, we consider the problems: (1) What is the minimum number of crews that are needed to maintain the operation. (2) How many aircrews are needed to be staged at each location. (3) If the number of available aircrews is less than the minimum needed, which legs of what missions may be delayed so that the minimum required number of aircrews is reduced. We will exclude from the analysis the trivial case where the rest period of the aircrews is always less than the period of time for which the aircrafts are delayed. If this is the case, then it is clear that the minimum number of aircrews is equal to the number of missions and all the aircrews must be staged initially at the home base.

AD-A109 205/5 PC **A03**/MF **A01**
Army Aviation Research and Development Command, St. Louis, MO.
Acquisition Cost/Price Estimating,
Edward P. Laughlin. 1981, 40p
Presented at the 16th Annual Department of Defense Cost Analysis Symposium, Arlington, VA. 4-7 Oct 81.

Contract pricing is a term which covers three sequential areas. First is the analysis of each firm's price by using the techniques of cost and/or price analysis. Second is the establishment of a prenegotiation goal (total cost plus profit or fee: or total price) to be used during the actual negotiations with each company. Third is the actual negotiation and agreement on a contractual arrangement (price and contract type) which comes as close as possible to the prenegotiation goal, considering both the additional information gained during negotiations and the ability and willingness of both parties to come to an agreement.

AD-A109 286/5 PC **A08**/MF **A01**
System Development Corp., Santa Monica, CA.
A Resource Planning Aid for Assessing the Personnel and Logistics Implications of Tactical Operations.
Final rept. 8 Feb 79-7 Feb 80,
Robert N. Parrish, Gordon W. Stevens, and Steven R. Stewart. Jun 81, 161p SDC-TM-6789/000/00, ARI-RR-1295
Contract DAHC19-77-C-0018

This report describes the research performed by the System Development Corporation (SDC) to develop data processing techniques to enhance the performance of personnel and logistics at corps and subordinate echelons. The research focussed on admin/log functions that related directly to tactical command and control. European and CONUS Corps provided principal sources of data used to isolate Resource Planning as the function most needing support. A conceptual job aid was then developed to support the area under investigation and tested using a modified CGSC scenario to determine feasibility. An evaluation briefing on the methodology was prepared, in concert with CACDA and ARI, and presented to staff officers in the European Theater to determine its ability to fulfill the needs of the user. The major finding of the evaluation is that the methodology is needed and should be considered for implementation in European Theater. (Author)

AD-A109 295/6 PC **A02**/MF **A01**
North Carolina Univ. at Chapel Hill. School of Business Administration.
An Inventory Model for Special Handling of Extreme Value Demands.
Technical rept.,
Douglas J. Blazer, and Marilyn K. McClelland. Dec 81, 19p Rept no. TR-19
Contract N00014-78-C-0467

We develop a stationary, discrete-time inventory model with a point Tau, such that any demands that exceed the value of Tau are not filled from existing stock. We show under what conditions it is economically advantageous to use this model and provide some numerical results. We then show how to find the optimal value for Tau. (Author)

AD-A109 315/2 PC **A04**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
V.I. Lenin and the Soviet Armed Forces (Selected Pages),
A. S. Zheltov. 7 Dec 81, 60p Rept no. FTD-ID(RS)T-1445-81
Unedited machine trans. of V.I. Lenin i Sovetskiye Vooruzhennyye Sily (USSR) p113-136 1967.

No abstract available.

AD-A109 367/3 PC **A02**/MF **A01**
George Washington Univ., Washington, DC. Program in Logistics.
Planning for Future Naval Forces and Their Ownership Costs.
Technical memo.,
Rolf Clark. 31 Aug 81, 11p Rept no. SERIAL-TM-68612
Contract N00014-75-C-0729
Presented to the Annual Department of Defense Cost Analysis Symposium (16th).

Naval policy planning requires viewing the entire spectrum of annual resource allocation, over a long period. Emerging research into the trade offs between force asset levels and fund flows to support those assets is described. The method underlying the results is a feedback simulation incorporating ship and aircraft assets and their operating, maintenance, and manpower characteristics, as well as fleet ownership policies, production factors, and relative price movements. The sensitivity of force levels and their funding requirements to changes in annual budgets, in fleet characteristics, in force mix, in relative prices changes, and in production rates, is explored. (Author)

AD-A109 371/5 PC **A02**/MF **A01**
Booz-Allen and Hamilton, Inc., New York.
Cost Data Base Development: A Twelve-Year Perspective,
Anthony C. Leggitt. 7 Oct 81, 14p
Presented at the Annual Department of Defense Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

We have a way to go in compiling the data needed to accomplish various cost estimating and analysis tasks. Data currently exists to answer most questions that arise and that for the most part it is partitionable to the extent required for particular applications. The real issue is one of obtaining the data in a timely manner and of reducing the redundant data collection effort needed every time a cost effectiveness question arises in the decision making arena.

AD-A109 372/3 PC **A02**/MF **A01**
MITRE Corp., Bedford, MA.
The Software Acquisition Resource Expenditure (SARE) Methodology, Data Requirements, and Data Utilization,
W. E. Byrne. 7 Oct 81, 20p
Presented at the Annual Department of Defense Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

SARE reporting is a data collection methodology used to collect software-unique financial data plus technical data that make the financial data meaningful. The data can be used to monitor the progress of software development work on the contract in which the data is collected. Also, the data is to be submitted to a multiproject Air Force Systems Command (AFSC) software data base. The data base will help formulate, calibrate, and validate software cost/schedule estimation methods.

HRP-0903798/7 PC **A04**/MF **A01**
Alpha Center for Health Planning, Bethesda, MD.
Block Grants and the Role of Health Planning Agencies,
Claire Lipschultz. Oct 81, 52p
Contract PHS-HRA-232-79-0035

This briefing paper is intended to provide local and state planning agencies with critical information about the health block grant program and to help them identify approaches for involvement in allocation decisions. The paper first presents an overview of the health block grants which were created by the Omnibus Budget Reconciliation Act of 1981. The second section describes in detail the major elements of the four health block grants and the direction that states have taken in the implementation of the grants. Although other blocks provide dollars to health related programs they are not addressed in this document. The third section considers the processes of several states in designing block grant implementation and budget cut approaches. The fourth section identifies the unique role health planning agencies can play and are playing to assist states' determination of health program priorities.

N82-14985/7 PC **A08**/MF **A01**
New York Univ., NY. Center for Science and Technology Policy.
The Changing TIDE: Federal Support of Civilian-Sector R and D.
H. I. Fusfeld, R. N. Langlois, and R. R. Nelson. 1 Nov 81, 151p NASA-CR-165048
Grant NSG-7636

The involvement of the Federal government in civilian sector research and development is discussed. Relevant policies are put in an historical perspective. The roles played by indusrial research and public funding are reveiwed. Government support of basic an generic research, clientele-oriented applied research, and research with commercial ends is studied. Procurement, anti-trust, and patent policies, all of which affect the climate for private research and development, are examined.

N82-14988/1 PC **A06**/MF **A01**
Ecole Nationale Superieure de Techniques Avancees, Paris (France).
Research Activities Report in Advanced Technology Rapport d'Activite sur les Recherches a l'Ecole Nationale Superieure de Techniques Avancees en 1980.
Annual Report, 1980.
1980, 124p
Text in French. Original Contains Color Illustrations.

Scientific and experimental research is reported on. Work centers on chemistry, hydrothermodynamics data processing and information sciences, materials science, structural engineering, and optics.

PB82-138694 PC **A04**/MF **A01**
North Dakota League of Cities, Bismarck.
Development of a Plan for an Upper Plains States Innovation Group.
Final rept.
Mar 80, 69p NSF/RA-800600
Grant NSF-ISP79-10293

The purpose of this plan was to facilitate the utilization of scientific and technological resources by local governments in the geographic region including Montana, North and South Dakota, and Wyoming. These resources include the application of the management sciences, computer software, technical equipment, and new materials and methods. The experience of other innovation groups nationally has demonstrated that a systematic approach involving five steps is essential to the introduction of technical innovations to local government: needs analyses; technology adaptation; demonstration; technology transfer; and application assistance. An institutional structure for the Upper Plains States Innovation Group (UPSIG) has been developed and work has begun on the development of a research and development agenda. Evaluations of several technologies have been initiated. The North Dakota State Highway Department is laboratory testing a liquid silica binder for stabilizing unpaved roads. A new material, foamed asphalt, is under preliminary testing as a pothole patching material. Also an automatic thermostat setback device for conserving energy in public facilities is being tested through UPSIG in a local government.

PB82-139130 PC **A02**/MF **A01**
Pacific Northwest Innovation Group, Vancouver, WA.
Description and Evaluation of a Twelve Month Field Service Support Effort Provided to the Federal Laboratory Consortium.
Final rept.,
Gerald E. Miller. Mar 80, 24p NSF/RA-800599
Grant NSF-ISP79-07355

The primary objective of this effort was to provide direct assistance to the Federal Laboratory Consortium (FLC) for improving the cooperation between laboratories and user groups within the public and private sector. The FLC consists of approximately 200 Federal research and development laboratories and centers in the United States representing ten of the major Federal agencies. Its members are divided into six regional groups. This report details the program plan, the activities undertaken, and the relative successes and failures of each group. Specific recommendations are made to achieve greater visibility for the FLC and to define the role of an outside person or agency in achieving that goal.

PB82-145806 PC **A02**/MF **A01**
Public Technology, Inc., Washington, DC.
Community Technology Initiatives Program Annual Report 1979.
1980, 16p NSF/RA-800601
Grant NSF-ISP79-18742

The Community Technology Initiatives Program (CTIP) helps small communities use technology by providing a technology agent to each of seven groups, or circuits, of small communities across the United States. Each technology agent is an engineer or scientist on loan from a Federal laboratory. Technology agents travel from community to community, showing local governments how to do certain tasks better or for less money, or helping them do things they could not do alone. CTIP technology agents have identified 500 local problems with possible technological solutions. They have thus far solved 172 of them. As a result, the 32 local governments on CTIP's seven circuits collectively are saving nearly one million dollars a year. Additional savings will be realized when other localities apply the same solutions to similar problems. This report details some of the solutions which include the following programs: the automatic recording of emergency telephone calls from citizens; a special meter-reading device being used in one small city; the computerization of police activity data; and the computerization of garbage collection management.

PB82-146176 PC **A04**/MF **A01**
Computer Horizons, Inc., Cherry Hill, NJ.
Ten Year Trends in U.S. Technological Dependence on Foreign Science and Technology as Indicated by Referencing from U.S. Patents. Phase I Report: A Feasibility Study,
Mark Carpenter. 22 Jun 81, 62p NSF/PRA-81010
Grant NSF-PRA80-17357

A feasibility study for a proposed full scale examination of recent trends in the United States and foreign technological interactions is presented. Certain questions were chosen for the study based on the validity of using examiner citations to scientific dependence literature and to foreign patents as indicators of science dependence and foreign dependence. Twenty-four technologies were selected and divided into three broad patent areas--chemical, electrical, and mechanical. These were categorized into areas judged as probably highly science and those not; and areas judged as probably highly foreign-dependent and those not. The study includes data from about 2400 patents chosen at random from the Patent Bibliographic File. Further rankings narrowed the field to 19 high level research managers representing 17 of the technologies obtained. After rankings on science dependence and foreign dependence were received, a consensus ranking on each dependence was determined. Results of the study indicate a high correlation between top level research managers' consensus ranking of technologies on foreign and science dependence and rankings based on examiner citations and other bibliographic information. The report includes data acquisition and data analysis.

PB82-147950 PC **A04**/MF **A01**
American Univ., Washington, DC. Inst. for Applied Public Financial Management.
Realignment of the Integration Function in Systems Acquisition in the United States Army Materiel Development and Readiness Command.
Final rept.,
David C. Mercer. Dec 81, 53p 110-80-VII
Sponsored in part by Army Materiel Development and Readiness Command, Alexandria, VA.

The managerial problem solved by this study was the development of an integration Branch within the command headquarters by developing and getting approval of a mission and function (M&F) statement, a design, 21 job descriptions, and a plan for commencing operation of the Branch on 15 Oct 1981. The first 51 pages reviews the rationale for the M&F, and analyzes three alternative designs, presents the plan for initiating the Branch, and for assessing organizational effectiveness of the Branch. TAB A is 110 pages of approved job descriptions. TAB B is footnotes. TAB C is the bibliography. TAB D is a review of the federal job series considered in designing the Branch, and the skills required for the series.

PB82-148941 PC **A05**/MF **A01**
Department of Transportation, Washington, DC. Office of Intergovernmental Affairs.
Technology Sharing: A Guide to Assistance in Obtaining and Using Research, Development and Demonstration Outputs (3rd Edition).
Final rept.,
Alfonzo B. Linhares, Norman Paulus, and Eric Smith.
Oct 79, 96p DOT-I-79-26
See also PB-249 101.

The document is a guide in obtaining and using research, development and demonstration products and an overview of the various mechanisms and programs used to provide technical materials to state and local governments. Written in non-technical language, this report should be useful to governmental officials and technology transfer professionals at all levels.

PB82-150129 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
Transferability of Budgets for Community Services.
Staff rept.,
John A. Kuehn, and Maryls Nelson. Dec 81, 10p
AGES-811116

This report investigates the applicability of transferring estimates of needs, capital costs, and operating costs for specific community services in one area to another area. Based upon studies of rural water systems and rural fire protection services completed by the ERS local decisions project and Oklahoma State University, estimates of needs are area-specific. Estimates of costs are also area-specific unless the areas are very similar and within the same general region of the United States.

PB82-150418 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
Using 1977 Census of Governments Data: A Guide for Research on Rural Government.
Staff rept.,
Judith N. Collins, and Leon B. Perkinson. Dec 81, 48p AGES-811109

Data on the finances and employment of local governments collected for the 1977 Census of Governments varied by type and size of government. Considerably less detailed information was obtained for small units of government than for larger units. As a result, detailed analyses of finances and employment are possible for the larger units, while the data available for small governments restrict analyses which include all governments. In addition, governments for which data are estimted are more likely to be in nonmetropolitan areas. County area data should be reasonably accurate especially for the more populous areas.

PB82-151580 PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Contract Time Determination.
Final rept.
Oct 81, 55p TRB/NCHRP/SYN-79, ISBN-0-309-03166-4
Sponsored in part by Federal Highway Administration, Washington, DC., and Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 81-84294. Also pub. as ISSN-0547-5570. Report on National Cooperative Highway Research Program, Synthesis of Highway Practice.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This synthesis will be of special interest to construction engineers and others concerned with contract administration. Guidelines are presented for the consideration of relevant factors in determining contract time.

PB82-152927 PC **A13**/MF **A01**
Urban Systems Research and Engineering, Inc., Cambridge, MA.
Grant Consolidation for the U.S. Territories.
Final rept.
Sep 81, 289p ASPE/PS-80-1
Contract DHHS-100-80-0134

The study evaluated the efforts of HHS and the Department of Education to consolidate under the provision of P.L. 95-134 the administration of formula grants to the Insular Territories--Guam, Northern Marianas, American Somoa, the Trust Territory of the Pacific Islands and the Virgin Islands. The study describes HHS and Ed implementation of the consolidation authority; assess its adequacy and identify options for improving HHS and Ed use of the legislative authority, as well as what kinds of consolidation could be used. The study will be useful to HHS and Education in restructuring and implementing activities and will provide a framework for subsequent evaluations of the effects of consolidation.

PB82-153099 PC **A02**/MF **A01**
Planning Commission, New Delhi (India).
Performance Budgeting for Capital Projects,
C. S. Parthasarthy. 1981, 25p

Performance Budgeting is essentially a technique by which programs, projects, activities etc. may be identified in a budget in physical and financial terms so that the relationship between inputs on the one hand and outputs on the other, can be more clearly established. The technique is designed to serve as a management tool for more effective planning implementation and monitoring of programs, projects, activities etc., the objective being to redesign a basic management tool with a view to improving the quality and speed of decision-making at various levels of management in an organization. The paper spells out the basic elements of the technique of Performance Budgeting Approach to Capital Projects and the various steps that should be taken to obtain the best results from its application.

PB82-153578 PC **A04**/MF **A01**
George Washington Univ., Washington, DC. Inst for Management Science and Engineering.
An Interactive Branch-and-Bound Algorithm for Multiple Criteria Optimization.
Rept. for 31 May 81
Odile Marcotte, and Richard M. Soland. 31 May 81, 61p SER-T-442
Grant NSF-ECS79-11909

The report presents a new interactive algorithm for multiple criteria optimization. The algorithm is of the branch-and-bound type, and differs from previous interactive algorithms in several ways. First, the field of application of the algorithm is wider because it applies to two important classes of multiple criteria decision problems: those for which the feasible set is convex and those for which the feasible set is discrete. Secondly, the algorithm does not require a great deal from the decision maker. After presenting the algorithm and its variations in detail, the report describes some simulation experiments performed with the algorithm and discusses the results.

PB82-154170 PC **A05**/MF **A01**
Institute of Public Administration, Washington, DC.
Financing Transit: Alternatives for Local Government.
Executive summary.
Jul 79, 84p DOT-I-79-15
See also PB80-129331, and PB80-125537.

This report provides a general overview of financing options local governments can use for transit pay, real estate value incumbent taxes, taxes on motor vehicle users, payroll taxes, property taxes, retail sales taxes, income taxes, and excise taxes are among the topics covered.

PB82-160060 PC**$6.00**/MF **A01**
Department of Defense, Washington, DC.
Research, Development, Test and Evaluation Program (R-1), Department of Defense Budget for Fiscal Year 1983.
8 Feb 82, 67p

This document provides details of the request for the FY 1983 Research, Development, Test and Evaluation (R,D,T&E) Program of the Department of Defense. It is derived from and is consistent with the DoD Five Year Defense Program R,D,T&E Annex data base.

PB82-856345 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Project Management. 1974-February, 1982 (Citations from the Management Contents Data Base).
Rept. for 1974-Feb 82.
Feb 82, 170p
Supersedes PB81-852980.

This bibliography cites articles discussing industrial and commercial project management. Cost overruns, project appraisal, cost improvement programs, rate of inflation evaluation, project communications, and computerized controls are included. (This updated bibliography contains 246 citations, 46 of which are new entries to the previous edition.)

PB82-862053 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Critical Path Method. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 158p

Citations in this bibliography cover principles and techniques for utilizing the critical path method in planning, scheduling, and operational activities. Critical path analysis is cited for networks, computer software, systems design, circuit design and testing, project engineering, and decision making. (Contains 158 citations fully indexed and includes a title list.)

5B. Documentation and Information Technology

AD-A109 201/4 PC **A02**/MF **A01**
Air Force Logistics Command, Wright-Patterson AFB, OH.
A Life Cycle Cost Data Base for Automated Data Systems,
Walter J. Houlette. 1981, 16p
Presented at the 16th Annual Department of Defense Cost Analysis Symposium, Arlington, VA, 4-7 Oct 81.

When it is necessary to project the cost of a new automated data system (ADS), are your analysts using a base of data derived from the development of your systems, or are your estimates being made, based upon data from a source outside your organization. Several data bases are made up of data from a wide range of sources. Using these creates many questions, such as: are the data really pertinent, what bias is introduced by using somebody else's data base, and could the impact of biased data be identified. We often hear that there is no widely accessible base of data that is usable to estimate software costs. The literature is replete with statements lamenting the lack of ADS cost data, but most of the recently developed cost models require the input of historical cost information, or estimates of the same, in order to obtain usable results. At AFLC, we took a straight forward approach to solving this problem.

AD-A109 319/4 PC **A04**/MF **A01**
Army Field Artillery School, Fort Sill, OK.
Index to the Field Artillery Journal, Author and Subject Index, January 1977 - December 1981. Volumes 45-49.
Final rept. 1977-1981,
Lester L. Miller, Jr. 1 Jan 82, 63p Rept no. INDEX-6
See also Index 2, AD-A053 085.

This author-subject index, which covers the period from January 1977 through December 1981, is the third volume in the series. The intention of the index is to amplify coverage provided by the journals index coverage by including authors and exploring subjects at different levels of depth, as required. Throughout, emphasis is on the principal subject of artillery.

AD-A109 387/1 PC **A03**/MF **A01**
Office of Naval Research, London (England).
European Scientific Notes, Volume 35, Number 11,
Francis A. Richards, and Don J. Peters. 30 Nov 81, 37p Rept no. ESN-35-11

Partial contents: Artificial and Human Intelligence; Organizational Change in Merchant Shipping; Unit of Blood Pressure: Protecting the Millimeter of Mercury; Third International Symposium on Inorganic Ring Systems; NATO Advanced Research Institute on Surface Modification and Alloying of Materials by Direct Energy Processing; and FRAM Ice Floe Stations.

AD-A109 417/6 PC **A04**/MF **A01**
SACLANT ASW Research Centre, La Spezia (Italy).
The SACLANTCEN Oceanographic Data Base. Volume II. Access, Interrogation and Display.
Memorandum rept.,
Richard F. J. Winterburn. 15 Jun 81, 58p Rept no. SACLANTCEN-SM-151
See also Volume 1, AD-A103 277.

An oceanographic data base established at SACLANTCEN on an 'in-house' UNIVAC 1106 computer system is described. Volume I discusses the design criteria used in setting up the data base, lists its structure and content, and explains how acquired data, either from outside institutions or from SACLANTCEN experiments are re-formatted and entered. Volume II describes how data are accessed, interrogated, and displayed, including the plotting of charts with coastlines and of contoured data. (Author)

NUREG-0566-V1-N10 PC **A11**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Management and Program Analysis.
Standards Development Status.
Summary rept.
Dec 81, 229p
See also NUREG-0566-V1-N6.

The Standards Development Status Summary Report is designed for scheduling, monitoring, and controlling the process by which Regulatory Standards, Guides, Reports, Petitions, and Environmental Statements are written. It is a summary of the current schedule plans for development of the above products.

PB82-148289 PC **A06**/MF **A01**
British Library, London (England). Research and Development Dept.
Academics, Librarians, Resource Management and Resource Use: A Preliminary Study,
Ernest Roe. c1981, 102p BLR/D-5649, ISBN-0-905984-77-3
Also pub. as ISSN-0308-2385.

The report describes a project undertaken in Great Britain to explore the relationships between teaching methods in universities and provision and management of library resources. The report surveys existing relationships and prepares for future research.

PB82-149618 PC **A03**/MF **A01**
British Library Lending Div., Boston Spa (England).
Non-Bibliographic Online Databases: An Investigaton into Their Uses Within the Fields of Economics and Business Studies,
B. Houghton, and J. C. Wisdom. c1981, 36p ISBN-0-905984-70-6, 5620
Also pub. as ISSN-0308-2385.

This report is a state of the art survey on the use of non-bibliographic data bases in Great Britain.

PB82-150111 PC **A03**/MF **A01**
Public Technology, Inc., Washington, DC.
Street Management Information System.
Information bulletin.
Sep 80, 48p DOT-I-80-43

The information bulletin addresses the concerns of the local officials as they consider developing street management information systems. The major issues it discusses are: Technological changes; Time and cost; Interagency coordination; Initial data collection; and Updating, maintenance, and management. This information bulletin also contains an annotated bibliography for future reference for the reader.

PB82-151945 PC **A04**/MF **A01**
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
California Sea Grant College Program Directory 1981-82.
Sep 81, 54p R-CSGCP-007, NOAA-81102106
Grant NA80AA-D-00120
See also report for 1979-80, PB80-112071.

This directory lists projects of the California Sea Grant College Program funded during 1981-1982. It gives project titles, numbers, and project leaders. It is organized by subject area, and each citation includes a brief description of project objectives. The subject areas are: managment, education and advisory services; coastal resources research; aquaculture research and development; fisheries research and development; fisheries product development; new marine products research and development; ocean technology; and marine affairs.

PB82-153255 PC **A02**/MF **A01**
Planning Commission, New Delhi (India).
Monitoring and Information System for Plan Implementation,
C. S. Parthasarathy. 1973, 18p
Pub. in the Indian Jnl. of Public Administration, v19 n3 p378-392, Jul-Sep 73.

There is a distinction drawn between the management function of planning and that of monitoring. Monitoring may usually be looked upon as the process of ensuring that performance takes place in conformity with plans. This would be in sharp contrast to plans which determine the objectives, means, and standards against which performance can be measured. Planning and monitoring, both conceptually and operationally, are inextricably interwoven. The role of information is pervasive in the operations of government. Information is rarely an end in itself; yet information--its availability, relevance, accuracy, timeliness, completeness and presentation format--plays a crucial role in almost every activity of government, namely, in policy-making, planning, decision-making, project/program formulation, implementation, monitoring, and evaluation. Thus, the excellence and effectiveness of government at all levels is, to a considerable extent, based on the quality of its information.

PB82-155532 PC **A03**/MF **A01**
Scottish Universities Research and Reactor Centre, East Kilbride.
Scottish Universities Research and Reactor Centre, East Kilbride: Report on Session 1979-1980.
Annual rept.
1980, 33p SURRC-68/81

Topics discussed include the following: Reactor related activities--(Physics, Radiochemistry, Health physics & nuclear medicine, Computing, Engineering); Isotope Geology; NERC Radiocarbon Laboratory; Teaching; Building; Committees; Staff at the Centre; Publications.

PB82-157058 PC **A13**/MF **A01**
Northwestern Univ., Evanston, IL.
Automated Record Summaries: Analysis of an Experiment.
Executive summary (Final) 1 Sep 77-31 Aug 80,
James L. Rogers, and Olga M. Haring. Aug 81, 293p
NCHSR-82-7
Grant PHS-HS-02649

This report examines the impact of the Northwestern University Medical Record Summary System (NUCRSS) on the process and outcome of care in the University's cardiac, pulmonary and renal (CPR) clinics. Existing studies suggest that automating the medical record may have a positive impact on the process and outcome of care as well as on health care costs. The purpose of this study was to explore in greater detail the impact of one medical information system (MIS), the NUCRSS, in the first area--process and outcome of care. Utilizing a prospective, randomized design, this study compares an experimental group that used the NUCRSS to a control group that used the traditional source-oriented record only. The NUCRSS was designed to: (1) provide the clinician with a convenient, concise, current and legible summary of the patient's record; (2) identify clinicians' recommendations (tests or procedures ordered) that were not carried out; (3) identify omissions in the recording of observations and in the recording of recommended treatment; (4) identify deficiencies in medical reasoning; and (5) recommend corrective action. Essentially the NUCRSS 'abstracts' summary medical record data relevant to these objectives from the full patient record and then presents the summary in an eight-page computer printout that is updated before each patient visit.

PB82-158056 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Informing the Public About Food--A Strategy is Needed for Improving Communication.
8 Jan 82, 82p CED-82-12

Consumers have difficulty deciding what foods to buy because of the vast selection of food items, rising food prices, and a growing desire to select health-promoting foods. The Federal Government has developed an extensive array of regulations and programs that provide information on food. While these have helped, an overall food information strategy does not exist. As a result, information is given piecemeal and sometimes is duplicative, conflicting, and confusing. Many Government, education, and industry food experts GAO contacted believed that a mechanism is needed that would bring together members of the food community to work cooperatively on a food information strategy. These experts helped GAO develop a model that could be used in designing a food information strategy, which should help to reduce regulatory duplication and consumer confusion.

5C. Economics

AD-A108 785/7 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
FORDAT-An Information Retrieval System for Forest Economic Data.
Forest Service general technical rept.,
Henry Spelter. Aug 81, 18p Rept no. FSGTR-FPL-33

Time series data frequently used in Forest Service studies of wood products consumption have been stored in a data retrieval system on the computer of the University of Wisconsin. The data cover activity in wood processing from forest to end use. Prices and costs at succeeding stages, historical usage, production rates, and other relevant data to wood use analysis were compiled. The system is available on-line and may be accessed directly or the data may be obtained in printed form by interested users. (Author)

AD-A109 147/9 PC **A03**/MF **A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
An MDI Model and an Algorithm for Composite Hypotheses Testing and Estimation in Marketing.
Research rept.,
A. Charnes, W. W. Cooper, D. B. Learner, and F. Y. Phillips. Sep 81, 33p Rept no. CCS-397
Contract N00014-81-C-0236
Prepared in cooperation with Carnegie-Mellon Univ., Pittsburgh, PA. School of Urban and Public Affairs under Contract N00014-81-C-0410.

A strategy is provided for using constrained versions of the MDI (minimum discrimination information) statistic to test and estimate market relations involving composite hypotheses. An algorithm for applying the tests and effecting the estimates is also provided along with numerical illustrations. Other, more general, developments in statistics and mathematical programming (duality) theories and methods are also briefly discussed for their possible bearing on further uses in marketing research and management. (Author)

AD-A109 311/1 PC **A02**/MF **A01**
Office of the Secretary of Defense, Washington, DC.
The Impact of Defense Spending on the American Economy.
David L. Blond. 1981, 19p
Presented at the Department of Defense Annual Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

The author discusses the impact on the economy of defense spending from the point of view of an economist rather than of a politician. Politicians and political appointees make judgments as to relative worth of social programs and defense programs. He attempts to examine the impact of defense expenditures on the economy in a way that is not biased by any preconceived judgements.

ITA-82-02-501 PC**$15.00**/MF **A01**
Kindel (K.W.), Berlin (Germany, F.R.).
Brief on the Market for Computers and Related Equipment in Belgium.
Oct 81, 68p
U.S. sales only for 8 months. Available to foreign addressees in Oct 82.

This report contains international marketing information that may be of interest to potential exporters of computers and related equipment. The Belgium computer market is assessed in terms of market size and trends, competition, special market influences, and specific products markets.

ITA-82-02-502 PC**$15.00**/MF **A01**
Japan Market Research Bureau, Tokyo.
Sporting Goods and Recreational Equipment - Japan.
Dec 81, 221p
U.S. sales only for 8 months. Available to foreign addressees in Oct 82.

The purpose of this study was to investigate the Japanese market for some selected categories of sporting goods and recreation equipment, in relevance with the possible imports of U.S. products related. More specifically, the study was to (1) develop a credible overview of the market including outlook for the market over the next 5 years; (2) identify specific types of goods with most promising sales potential over the next 5 years; (3) identify market sectors that offer the best opportunities for U.S. exports; and (4) identify market conditions which favor or impede the importation of U.S.-origin products.

ITA-82-02-503 PC**$15.00**/MF **A01**
Lindsey (Richard P.), Sao Paulo (Brazil).
Laser and Electro-Optical Equipment - Brazil.
Nov 81, 38p
U.S. sales only for 8 months. Available to foreign addressees in Oct 82.

This report contains international marketing information that may be of interest to potential exporters of laser, fiber optics and other electro-optical equipment. The Brazilian market for this equipment is assessed in terms of market size and trends, import taxes, import quotas, and ways that the equipment are utilized by end-users.

N82-14981/6 PC **A02**/MF **A01**
Strasbourg-1 Univ. (France). Bureau d'Economie Theorique et Appliquee.
Economic Effects Induced by Esa Contracts, Phase 2. Volume 1: Summary les Effets Economiques Induits des Contrats de l'Esa. Phase 2. Volume 1: Resume.
P. Brendle, P. Cohendet, J. A. Heraud, R. Laruedetournemine, and H. Schmied. Jun 80, 22p
ESA-CR(P)-1462-V-1
Contract ESA-3702/78/F-DKR(SC)
Text in French.

Different effects are classified by: technological advantages; commercial gains; organization and methodological advances; and impact on employment. Exports and limiting, or substitution for, imports are considered. Advantages other than space research were estimated for each sector of the economy and by country. Project Meteosat is shown to be of particular value. Results show that innovations due to ESA funding center on two essential activities: processing, storage and dissemination of information; and conditioning, storage and distribution of energy.

N82-14982/4 PC **A07**/MF **A01**
Strasbourg-1 Univ. (France). Bureau d'Economie Theorique et Appliquee.
Economic Effects Induced by Esa Contracts, Phase 2. Volume 2: Main Report les Effets Economiques Induits des Contrats de l'Esa. Phase 2. Volume 2: Rapport Principal.
P. Brendle, P. Cohendet, J. A. Heraud, R. Laruedetournemine, and H. Schmeid. Jun 80, 148p
ESA-CR(P)-1462-V-2
Contract ESA-3702/78/F-DKR(SC)
Text in French.

Technological advantages, commercial gains, organizational and methodological advances, and impact on employment are discussed. Quantitative results are given by sector of the economy, country and by contracting industry. The exceptional utility of project Meteosat is revealed. Innovations achieved in the distribution of productivity and technological independence won through ESA efforts are considered.

N82-14983/2 PC **A04**/MF **A01**
Strasbourg-1 Univ. (France). Bureau d'Economie Theorique et Appliquee.
Economic Effects Induced by Esa Contracts. Phase 2. Volume 3: Theory and Method les Effets Economiques Induits des Contrats de l'Esa. Volume 3: Rapports Theorique et Methodologique.
P. Brendle, P. Cohendet, J. A. Heraud, R. Laruedetournemine, and H. Schmied. Jun 80, 57p
ESA-CR(P)-1462-V-3
Contract ESA-3702/78/F-DKR(SC)
Text in French.

The economic utility of ESA contracts to the European community was determined. The economic impact of R and D was cost/benefit analyzed, macroeconomically and microeconomically. Results are given as: technological effects; commercial gains; organizational and methodological advances; and influences of ESA contracts on contractor personel. Project Meteosat is taken as an example. Data acquisition is discussed. The statistical significance of the sample is shown.

N82-14984/0 PC **A08**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Cologne (Germany, F.R.).
Scenarios of Economic Development within the European Community Until the Year 2000.
H. Keimel, and A. Schmitt. Feb 81, 174p DFVLR-FB-81-08
In German; English Summary. Report Will Also Be Announced as Translation (Esa-TT-730).

A tendency scenario is projected in order to assess the influence of the European economy on the need for long-distance transportation, i.e. by air. The tendency scenario is supplemented with two additional scenarios which illustrate possible trends in the European Economic Community either towards a technology based economy or towards a service economy. In the technology scenario it is assumed that after a stagnative period of transition economic growth impetus will result from technological innovations and world trade expansion. The service economy scenario describes a situation of low economic growth paralleled by strong expansion in the service sector. Based on the qualita-

tive characteristics of the scenarios, quantitative forecasts are made on economic structure.

N82-14986/5 PC **A21**/MF **A01**
New York Univ., NY. Center for Science and Technology Policy.
Technical Change in US Industry: A Cross-Industry Analysis.
R. R. Nelson. 1 Nov 81, 482p NASA-CR-165047
Grant NSG-7636

The nature of the public policies which have influenced the pace and pattern of technical progress in a number of American industries is studied with the view of assessing the broad effects of these policies. The industries studied are agriculture, pharmaceuticals, semiconductors, computers, civil aircraft, automobiles and residential construction. The policies considered include research and development funding as well as government procurement, education, information dissemination, patent protection, licensing, regulations, and anti-trust policies.

PB81-928005 PC **E08**/MF **A01**
Central Intelligence Agency, Washington, DC.
Handbook of Economic Statistics, 1981.
Nov 81, 215p NF-HES-81-001
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB81-928000.

This report provides statistics for selected non-Communist countries and all the Communist countries. In general, the data in the Handbook are for 1960, 1965, 1970, and 1975-80. Data for the Communist and non-Communist countries have been adjusted, when necessary, to achieve comparability and therefore may differ from data presented in the original sources. Footnotes have been used liberally to give definitions, exceptions, and methodology.

PB82-140286 PC **A11**/MF **A01**
Michigan State Univ., East Lansing.
An Econometric Analysis of the Geographic Distribution of Unemployment Rates.
Final rept. 15 Jun 80-15 Dec 81,
Kevin J. Murphy. 10 Nov 81, 244p DLMA-DD-26-80-012-1
Grant NCEP-DD-26-80-012
Doctoral thesis.

This dissertation comprehensively examines the geographic distribution of unemployment rates in the United States. The first section of the study focuses on the behavior of several measures of unemployment rate dispersion over time and shows that relative differences in geographic unemployment rates have remained constant--a result contrary to other research based on a more aggregate data set. In the second part of the dissertation, an economic model of unemployment rate dispersion is developed which allows for differing structural relationships across geographic sub-aggregates. Empirical implementation of the model reveals that geographic differences in unemployment rates are primarily determined by geographic differences in product market damand, structural and frictional elements, and non-labor income and that geographic differences in factor costs and educational attainment play secondary roles in this determination. The final portion of the dissertation examines the dynamic behavior of state unemployment rates and indicates that there is a great deal of variation in the relative positions which states occupy in the unemployment rate distribution both over the business cycle and in the long run. The empirical work utilizes state data and the sample period covers the years 1958-1978.

PB82-148636 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Economic Effects of Terminating Federal Marketing Orders for California-Arizona Oranges,
Peter K. Thor, and Edward V. Jesse. Nov 81, 52p
TB-1664

The shortrun effects of ending Federal marketing orders for navel and valencia organges produced in California and Arizona would probably be more severe than the long run effects. In the long run, seasonal fresh shipments of oranges and returns to growers would probably be comparable to the levels with orders. In the short run, shipping seasons would be shorter, weekly fresh shipments would be substantially larger, fewer oranges would be shipped for processing, prices would be more variable, and producer revenues would be lower.

PB82-149311 PC **A04**/MF **A01**
ARGOS Associates, Inc., Winchester, MA.
Analysis of Plastics Industries in the Major Industrial Countries.
Final rept. Jul-Nov 80,
Robert Kaiser. Dec 81, 65p DOT-TSC-OST-81-5
Contract DTRS-57-80-P-81404

This report provides data needed to support an assessment of the relative position of the US plastics resins industry, on a worldwide basis, in terms of its being able to support automotive manufacturing operations. The use of plastics in US and foreign automobiles is reviewed. Capacity, production and use statistics for major automotive plastics are presented. Historic and current prices for these plastics in the various countries of interest are presented and discussed in terms of the relative advantage of the US plastics resins industry.

PB82-149501 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Distribution of Frozen Products (Analysis of Distribution Costs) (Med Dypfryste Produkter i Lasten (Analyse av Ulike Distribusjonskanaler)),
Bjoern Vold, and Thor Svegarden. Jan 79, 58p ISBN-82-7133-243-0
Text in Norwegian.

The report describes different channels of distribution for frozen products and their distribution costs. Both distribution through wholesalers, routemen (combination delivery men and ordertakers) and order-distribution is analyzed. Transportation makes up 59% of total distribution costs for the routeman system compared to 25% for order-distribution. The report also discusses different quality aspects, which seem to be of great importance.

PB82-149550 PC **A03**/MF **A01**
National Marine Fisheries Service, Washington, DC. Fisheries Development Div.
Shellfish Market Review.
Sep 81, 49p CEA-S-43, NOAA-81102002

Consumption of shrimp, king crab and snow crab in 1980 was higher than in the previous year in response to lower prices and ample supplies. Other shellfish products were not as abundant, prices continued to rise, and consumption declined. Demand was generally lower because of the decline in the U.S. economy coupled with a slowdown of real disposable income and consumer spending. The year was marked by record high interest rates in the second and fourth quarters that raised the cost of operating.

PB82-151135 MF **A01**
Department of Commerce, Washington, DC.
Business America - The Magazine of International Trade, Volume 5, Number 1, January 11, 1981.
Biweekly pub.
11 Jan 82, 41p
See also Volume 4, Number 16, PB81-239444.
Paper copy available from Supt. of Docs.

Contents:
President imposes sanctions on U.S.S.R., Poland;
Congress busy with international business issues;
An update on countertrade with China;
Developing a new system for trade classification;
U.S. apparel exporters explore Latin markets;
Canada's West offers a flourishing market;
The world economy in 1982;
Business outlook abroad;
Worldwide business opportunities.

PB82-152810 PC **A02**/MF **A01**
Economics and Statistics Service, Washington, DC. Economic Development Div.
Rural Industrialization and Its Impact on the Agricultural Community: A Review of the Literature.
Staff rept.,
Priscilla Salant, and Robert D. Munoz. Apr 81, 19p
AGESS-810316

This report examines literature concerning (1) the link between farm scale and community welfare, and (2) the economic interface between agriculture and rural industrialization. Several farm region case studies conclude that employment and social services are more varied where smaller, family farms prevail, in other words, where agriculture is less industrial. Other studies, undertaken in rural areas where industry has located, indicate that part-time farmers may benefit from greater employment opportunities if their skill levels match industry's demand.

PB82-152984 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Expanding the Processed Product Share of U.S. Agricultural Exports,
Gerald Schluter, and Kenneth C. Clayton. Jul 81, 23p
AGESS-810701

During the 1970's the U.S. farm sector and grain and oilseed exporting firms enjoyed the benefits of expanded agricultural exports. Concerns have been expressed whether exporting raw grains and oilseeds fully exploit America's competitive advantage in the production of agricultural commodities. A procedure is presented for estimating the magnitudes of maximum economywide domestic economic effects of exporting a larger share of our agricultural abundance in processed form.

PB82-153107 PC **A07**/MF **A01**
Abt Associates, Inc., Cambridge, MA.
Development of a Crosscut Evaluation System, Phase I. Volume II: A Compendium of Impact Evaluation Methodologies.
Final rept.
Sep 81, 128p
Grant EDA-99-10-00007

The report is a reference document for the use of evaluation planners at the Economic Development Administration. It presents a set of recommended methodologies for measuring job creation and private investment stimulation, the two principal objectives of the Business Development and Public Works Programs. It also addresses the measurements of costs to the Agency, primarily for the sake of cost-effectiveness comparisons. Finally, the Compendium presents our approach to evaluating the Technical Assistance and Planning Programs.

PB82-154063 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Canada's Competitive Position in the North American Hog Industry.
Staff rept.,
Pat Weisgerber. Dec 81, 29p AGES-811216

Costs of producing hogs have escalated so fast that formula support prices under Canada's National Stabilization Act lagged far behind and became irrelevant. In the absence of effective federal help for producers, a majority of provincial governments intervened with income stabilization or stop-loss programs. This help for producers, and the depressed value of the Canadian dollar, have made Canadian hog producers competitive with their U.S. counterparts in the North American market. Quebec and Ontario producers should do particularly well in capturing part of the U.S. Northeast market. Prairie Province producers will not do as well in the U.S. West Coast market.

PB82-155060 PC **A06**/MF **A01**
State Univ. of New York at Albany.
Minority Business Development Agency Task Force Report on The Impact of Enterprise Zones on Small and Minority Business.
Final rept. Jul-Sep 81,
Thomas C. Dandridge, John E. Oxendine, and Steven C. Davidson. 30 Oct 81, 124p MBDA-81/1

The purpose of this report is to investigate the provisions of various Enterprise Zone proposals and determine the effect on small and minority businesses. The method employed by the four member task force was field research. Sixteen urban areas in the United States and Puerto Rico were visited. Interviews were conducted with a variety of state and local officials, business and professional associations, and minority and non-minority business persons. The investigations found that Enterprise Zones as described in proposed Federal legislation do not provide adequate incentives for small and minority businesses. Specifically, Zone proposals were seen by the interviewees as comprehensive urban development mechanisms which do not

possess adequate incentives for neither entrepreneurs nor financiers, and place undesirable labor cost burdens on small Zone businesses.

PB82-163551 PC **A07**/MF **A01**
Lewin and Associates, Inc., Washington, DC.
Research and Development Implications for Federal Directions in Capital Financing of Health Care Services.
18 Sep 80, 145p
See also PB82-163569 thru PB82-163635. A Summary of Conference Proceedings Held on September 18, 1980.

On September 18, 1980, the Office of Research, Demonstration and Statistics of the Health Care Financing Administration conducted a conference on R & D Implications for Federal Directions in Capital Financing. The conference was designed to share with federal officials and other interested parties the methods being used to reimburse capital costs and influence capital development under HCFA-financed state rate review systems and to allow discussion of the relationship of that experience to possible federal initiatives on capital financing of health care facilities. This is a report of the conference and includes edited transcripts of the principal presentations, summaries of the question and answer periods, and reference materials on the state capital reimbursement systems.

PB82-163569
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
The New Jersey System,
Bruce Vladeck. 18 Sep 80, 10p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p14-22 1980.

No abstract available.

PB82-163577
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
The Maryland Reimbursement System,
Harold Cohen. 18 Sep 80, 9p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p23-30 1980.

No abstract available.

PB82-163585
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Capital Formation Through Rate Setting: The Washington State Experience,
Frank D. Baker. 18 Sep 80, 12p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p31-41 1980.

No abstract available.

PB82-163593
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Control of Capital Growth in New York,
Jack Needleman. 18 Sep 80, 17p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p42-57 1980.

No abstract available.

PB82-163601
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Summary of the Morning's Proceedings,
Lawrence S. Lewin. 18 Sep 80, 10p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p58-66 1980.

No abstract available.

PB82-163619
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Federal Policies on Hospital Capital Reimbursement,
Jeffrey Merrill. 18 Sep 80, 7p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p67-72 1980.

No abstract available.

PB82-163627
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Federal Directions in Reimbursement Reform,
Karen Davis. 18 Sep 80, 8p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p73-79 1980.

No abstract available.

PB82-163635
(Order as PB82-163551, PC **A07**/MF **A01**)
Lewin and Associates, Inc., Washington, DC.
Federal Directions in Planning and Capital Management,
Suzanne Stoiber. 18 Sep 80, 14p
Sponsored in part by Health Care Financing Administration, Washington, DC.
Included in Research and Development Implications for Federal Directions in Capital Financing of Health Care Services, p80-93 1980.

No abstract available.

PB82-861584 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Consumer Cooperatives: Performance in Business. 1976-February, 1982 (Citations from the Management Contents Data Base).
Rept. for 1976-Feb 82.
Feb 82, 57p

This bibliography cites technical reports on the management and economic advantages of consumer cooperatives. The ability of most workers to raise capital from outside sources, results of specific cooperative pilot programs, problems of cooperative workers putting profits back into the business, industrial relation policy establishment and administration, and the economic factors which encourage the development of consumer cooperatives are discussed. Performance evaluations and future trends of consumer cooperatives in such markets as utilities, industrial manufacturers, food, finance, hospital services, and other public services are included. (Contains 64 citations fully indexed and includes a title list.)

PB82-928500 Subscription
Central Intelligence Agency, Washington, DC.
Economic and Energy Indicators.
Weekly repts.
1982, 52 issues
Supersedes PB81-928500.
Paper copy available on subscription, North American Continent price $65.00/year; all others write for quote. Also available in single copies.

The review provides up-to-date information on charges since 1974 in the domestic and external economic activities of the major non-Communist developed countries and selected developing countries. It consists of a combination of charts and tables. The charts depict (1) economic indicators (Industrial production, unemployment, and consumer price inflation), both composite and by country, for the Big Seven developed countries 'United States, Japan, West Germany, France, United Kingdom, Italy, and Canada'; (2) foreign trade and foreign trade prices for the Big Seven; and (3) monthly average prices for selected agricultural producers and industrial materals. The tables list recent and chronologically comparative data for direction of trade and for 13 items of economic interest for the Big Seven plus data for seven items of economic interest for selected developing countries.

5E. Human Factors Engineering

AD-A108 930/9 PC **A02**/MF **A01**
California Univ., San Diego, La Jolla. Center for Human Information Processing.
Why Alphabetic Keyboards Are Not Easy to Use: Keyboard Layout Doesn't Much Matter.
Technical rept.,
Donald A. Norman, and Diane Fisher. 15 Nov 81, 22p Rept no. 8106
Contract N00014-79-C-0323

It is well known that the Sholes or 'qwerty' keyboard is deficient in designed, hard to learn, and awkward to use. Alphabetically organized keyboards would appear to be superior for novice typists, but this has not been demonstrated in previous studies of typing. These experiments confirm the lack of virtue for alphabetically organized keyboards over both a randomly organized one and over the standard Sholes keyboard. To take advantage of the alphabetic keyboard requires considerable mental processing on the part of the user, and this processing is neither easy to do nor does it appear to offer much savings over visual search of the keyboard. The novice is faced with a tradeoff between mental processing and visual search, and this tends to make different keyboard layouts equivalent. In addition, many people know at least something about the Sholes keyboard, and even this little knowledge is useful, with the result that their performance will usually be better on Sholes than on alphabetic keyboards (and certainly no worse). The conclusion is that it is not worthwhile to use alphabetic keyboards for novice typists, nor to change to the Dvorak layout for experts. Keyboards can probably be improved, but only though radical redesign of the present physical key configuration.

AD-A109 331/9 PC **A03**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Computer Science, Industrial Engineering and Operations Research.
SAM -- A Configurable Experimental Text Editor for Investigating Human Factors Issues in Text Processing and Understanding.
Technical rept.,
Roger W. Ehrich. Sep 81, 38p Rept no. CSIE-81-3
Contract N00014-81-K-0143

There are numerous behavioral issues involving human-machine communications that are exemplified by text editing applications. Examples include scanning mechanisms and information location techniques, command language design, effect of language syntax on productivity and accuracy, and the relationship of syntax to the user task model. In general, there exist little data to support design goals, and in order to formulate studies of these issues, a flexible text editing system is required. This report describes SAM, a reasonably sophisticated text editor that has table driven command language and syntax that allows reasonably easy reconfiguration for special experiments. In particular, it is straightforward to insert the metering procedures required to measure specific aspects of human performance. (Author)

N82-14804/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Influence of Display and Control Compatibility on Pilot-Induced Oscillations.
M. C. Waller, R. L. Harris, Sr., and L. H. Person, Jr.
Dec 81, 40p NASA-TP-1936, L-14364

The differences in techniques used by seven pilots to acquire information from an advanced display for instrument approaches to and landings on a runway were investigated. A fixed base simulator programmed with dynamics resembling the terminal configured vehicle (TCV) was studied. It is shown that the seven pilots can be divided into two groups which used the display with distinctly different strategies for controlling the airplane. A related pattern of performance differences resulted. It is found that pilots who primarily use raw flight path information experience longitudinal oscillations while pilots using attitude information did not.

PB82-151374 PC **E04**/MF **E04**
National Maritime Inst., Feltham (England).
A Study of the Effect of Human Factors on the Handling of Two Ship Models,
I. W. Dand. c1981, 62p NMI/R-112

An investigation into the way in which human operators control a ship model on a straight course is described and the results presented and discussed. Some experiments were carried out in a simulated cross-wind and a comparison is made between calculated equilibrium drift and rudder angles and those actually used by the operators. Various parameters relating to controllability, (with special reference to controllability in port approach channels) are presented, and overall values for navigation lane widths both with and without cross-winds are deduced. (Copyright (c) Crown Copyright, 1981.)

PB82-151812 PC **A06**/MF **A01**
Pittsburgh Univ., PA. Dept. of Mechanical Engineering.
Hand Tool Vibration Associated with Jack Leg Drills, Jack Hammers and Slushers.
Final rept.,
Douglas D. Reynolds. 30 May 80, 118p
Contract PHS-NIOSH-210-79-0032

Vibration characteristics of jack leg drills, jack hammers and slushers were surveyed. Instrumentation and test procedures were described in a previously reported study. Information on overall acceleration levels and the total work per unit the for the tools, acceleration time histories of the tools, measured acceleration levels on the tool handles, calculated energy levels into the hands, and the power levels into the hand was presented. The total work per unit of time for the large jack leg drill was greater than that of the jack hammer at similar overall acceleration levels, and the difference was associated with the direction in which the hands were excited. For the jack leg drill, the hand was excited in the horizontal direction, while the hand was excited in the vertical direction with the jack hammer. These differences also were achieved for the horizontal and vertical directions for the slusher.

5F. Humanities

AD-A108 841/8 PC **A05**/MF **A01**
Oklahoma Historical Society, Oklahoma City.
The Deer Creek Site, Oklahoma: A Wichita Village Sometimes Called Ferdinandina: An Ethnohistorian's View. Series in Anthropology Number 5,
Mildred Mott Wedel, Martha Royce Blaine, and Gordon Moore. 1981, 90p
Contract DACW56-78-C-0056
Errata sheet inserted.

Contents: Identification of the Deer Creek site with a Panipiquees Village; Time Depth of Wichita Village Occupation at the Deer Creek Site; Pre-1740 French-Wichita Trade; Chronological review of the circumstances that led to cooperative Wichita-French hunting and meat processing activities at the Deer Creek site; The Myth of Fernandina; The Archeologists' Challenge.

PB82-147513 PC **A04**/MF **A01**
National Park Service, Tucson, AZ. Western Archeological Center.
Lithic Procurement at Lake Mead: The Collection of 26 C K 2375.
Final rept.,
Kathryn A. Kamp. Oct 81, 59p NPS/WAC-81/22

This report discusses three of the thirteen loci of 26CK2375, a lithic procurement site at Echo Bay, Lake Mead National Recreation Area, which was mapped and collected prior to the construction of trailer court facilities. The 26 discrete chipping stations and light scatter of isolated artifacts that were analyzed represented debitage from the initial reduction of locally-available chalcedony nodules for the eventual production of flake tools. Four knapping patterns were identified, roughly correlating with variations in the quality of the lithic material. Two of the patterns yielded no useable flakes or cores, the third some useable flakes and the fourth useable core segments. No datable artifacts were found, and the technology as revealed by the debitage is consistent with any of the aboriginal Lake Mead occupations.

PB82-147521 PC **A13**/MF **A01**
National Park Service, Tucson, AZ. Western Archeological Center.
Tumacacori Plaza Excavation 1979: Historical Archeology at Tumacacori National Monument, Arizona.
Final rept.,
Lee Fratt. Jul 81, 295p NPS/WAC-81/26, WAC/ANTHROPOLOGY-16

Excavations conducted at Tumacacori National Monument, Arizona, in 1979 recovered data that would have been destroyed by the installation of an underground drainage system in the Franciscan mission plaza and adjacent to the west wall of the mission church. This system was designed to aid in the stabilization of the historic structures. This report describes the surprisingly intact stratigraphy of the excavated area. Features and deposits were grouped into four areas of associated deposits and into four time periods ranging from ca 1750 to the present.

PB82-148412 PC **A06**/MF **A01**
Arizona State Museum, Tucson. Cultural Resource Management Section.
Salt-Gila Aqueduct Central Arizona Project Archaeological Data Collection Studies and Supplemental Class 3 Survey (Final).
Annual rept. 3 Jul 80-2 Jul 81,
Lynn S. Teague, and Patricia L. Crown. Nov 81, 111p
DI/BR/APO/CCRS-81/2
Contract DI-0-07-32-V0101

The report reviews the first year of archaeological work for-data recovery and supplementary survey for the Salt-Gila Aqueduct, Central Arizona Project. The report summarizes results of excavations at 33 sites and initial analysis of materials from these sites. The progress made in developing a public information program to communicate project activities is also summarized. The report incorporates an evaluation of certain aspects of project methodology including the experimental use of subsurface interface radar for identification of subsurface features without ground disturbance, laboratory procedures, and general excavation approaches.

PB82-148933 PC **A05**/MF **A01**
Arizona State Museum, Tucson. Cultural Resource Management Section.
Additional Studies of the Architecture of the Casa Grande and Its Interpretation.
Final rept.,
David R. Wilcox, and Charles Sternberg. Mar 81, 87p
ARCHAEOLOGICAL SER-146, NPS/WAC-81/23

This report presents new research results produced when elevation drawings of the interior wall surfaces of the Casa Grande were completed. The discovery that members of the Hemenway Expedition excavated at the Casa Grande site also revealed several fresh descriptions, leading to intriguing hypotheses that are tested and presented here. Newly recorded wall features and recent developments in Hohokam archaeology also led to new conclusions about most of the topics treated in an earlier report by Wilcox and Shenk (1977). Evidence for the special character of the Casa Grande is increased, and the hypothesis that its original activity system involved managerial functions in the local Hohokam society is strengthened.

PB82-149212 PC **A02**/MF **A01**
Central Washington Univ., Ellensburg.
An Archaeological Survey of the Oroville-Tonasket Project, Phase III, Okanogan County, Washington.
Final rept.,
Glenn D. Hartmann, and Garry Owen Stephenson. 1981, 19p
Sponsored in part by Bureau of Reclamation, Boise, ID. Region 1.

An archaeological survey of Phase III of the Oroville-Tonasket Project was conducted by Central Washington Archaeological Survey, Central Washington University. Survey included approximately 40 miles of pipeline right-of-way and approximately 45 acres of pumpstation and water storage facilities. No previously unrecorded historic or prehistoric sites were located during survey. Two archaeological sites and one National Register Property had been previously recorded in the project area. It is recommended that a professional archaeologist monitor construction activities near these sites. The National Register site will not be affected by pipeline construction.

PB82-152257 PC **A08**/MF **A01**
Pfaller (Mark F.) Associates, Inc., Milwaukee, WI.
Pictured Rocks, National Lakeshore, Michigan.
Historic resource study,
Frederick Stonehouse. Jan 81, 153p FNP-560-82-03

This historic resource study presents the many facets of development of the Pictured Rocks area in Michigan. The topics covered include: the Indians, Explorers and Missionaries, Fur Traders, Iron Industry, Shipping and Shipwrecks, Coast Guard, Au Sable Light, the Michigan Logging Boom, and Farmers, Fishermen, and Tourists. Each section's narrative is supported by quotes from primary sources and appendices which contain excerpts from journals. Mention of some of the area's notables such as John Jacob Astor and Schoolcraft is made with discussion of their endeavors in trading and iron forging. The economy of this area fluctuated greatly during its various stages of development with some enterprises ending and others flourishing within a matter of years. This report provides an overall look at the region's growth and some of its inhabitants over the last 200 years.

5H. Man-Machine Relations

AD-A109 280/8 PC **A04**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Computer Science, Industrial Engineering and Operations Research.
A Two-Dimensional Core Graphics System for Research in Human-Computer Interfaces.
Technical rept.,
Roger W. Ehrich. Oct 81, 63p Rept no. CSIE-81-4
Contract N00014-81-K-0143

Graphics is an important requirement for human-computer communication, and in order to construct good interfaces and conduct behavioral experiments, a flexible and reliable package is required. Such a package must be extensible, and because of the dynamic nature of facilities, it must be quickly adaptable to new device types. This report describes a limited implementation of the ACM/SIGGRAPH Core System that will be the vehicle for the graphics aspects of the research program at Virginia Tech in human factors in computation. (Author)

N82-14805/7 PC **A02**/MF **A01**
Fabrique Nationale d'Armes de Guerre, Herstal-les-Liege (Belgium).
Initiation into the Utilization of Programmable Industrial Robots: Grafcet Initiation a l'Utilisation des Automates Programmables Industriels.
P. Krzesinski. Mar 81, 25p
Text in French.

A technique for expressing automation problems, i.e., graph of command stage and transition (GraFcet), is presented. It is intended as a methodological tool which aids in the communication of automated systems specifications between client and contractor. The language GraFcet comprehends two levels of specification. The first level describes the behavior of the command part of a system in relation to the operating part (functional specifications). The second level sets technological and environmental specifications with which the command part of a system must operate (operational specifications). Fundamental notions and the practical use of GraFcet are explained.

5I. Personnel Selection, Training, and Evaluation

AD-A108 758/4 PC **A03**/MF **A01**
University of Southern California, Redondo Beach. Behavioral Technology Labs.
Intrusive and Non-Intrusive Instruction in Dynamic Skill Training.
Interim technical rept. Feb 80-Oct 81,
Allen Munro, Michael R. Fehling, Pierre Blais, and Douglas M. Towne. Oct 81, 47p Rept nos. TR-2, TR-97
Contract N00014-80-C-0164

A distinction is drawn between computer based instruction of knowledge systems and computer based instruction of dynamic skills. There is reason to expect

that the findings of research on knowledge system instruction will not apply universally to dynamic skill instruction. In particular, a theory of cognitive resource demand suggests that the principle of immediate instructional feedback may not apply in dynamic skill training. Because students in dynamic skill training are often heavily loaded with processing demands, instructional feedback must be postponed until the students have sufficient free resources to process it. This hypothesis was tested in an experiment in computer based instruction. One group of students received instructional feedback upon request, while a second group received feedback under program control. The group with control over feedback made significantly fewer errors in training than did the group that did not control timing of the instructional feedback messages. (Author)

AD-A108 934/1 PC **A05**/MF **A01**
RAND Corp., Santa Monica, CA.
The role of Service Experience in Post-Training Attrition in the Army and Air Force.
Interim rept.,
Richard Buddin. Nov 81, 99p Rept no. RAND/R-2682-MRAL
Contract MDA903-80-C-0652

This report develops a multivariate model describing the effects of individual characteristics, duty location assignments, career turbulence, and military occupational assignments on post-training enlisted male attrition in the Army and Air Force. The report concludes that military occupation and duty location are significantly correlated with attrition, after controlling for individual characteristics. The role of turbulence cannot be distinguished with current measures. Among individual characteristics, high school graduates have much lower attrition than nongraduates in all service occupational areas. Attrition varies insignificantly with mental test category, after controlling for other background and service experiences. Participation in a delayed entry program prior to entering the military substantially reduces the likelihood of post-training attrition.

AD-A108 986/1 PC **A06**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Integrated Avionics Electronic Warfare Equipment and Component Specialty, AFS 326X3A/B.
Dec 81, 101p

This report presents the results of a detailed Air Force Occupational Survey of the Integrated Avionics Electronic Warfare (EW) Equipment and Component specialty. The report was originally requested to obtain occupational data for use in evaluating the effectiveness of current training for personnel maintaining EW systems on the F-15. An additional request was made to include personnel who maintain F/FB-111 Avionics EW equipment in order to examine the utilization of these personnel.

AD-A108 993/7 PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
Narrative Job Descriptions as Potential Sources of Job Analysis Ratings.
Technical rept. May 80-May 81,
Allan P. Jones, Deborah S. Main, Mark C. Butler, and Lee A. Johnson. 5 May 81, 16p Rept no. NAVHLTHRSCHC-81-13

The present study investigated whether narrative job descriptions could be converted to quantitative rating scores using a traditional job analysis questionnaire. Detailed written descriptions of 121 jobs in a military health care facility were rated using the Position Analysis Questionnaire (PAQ). Indices of interrater agreement suggested acceptable levels of agreement for job dimension scores derived from these ratings. Further, when regressed against GATB abilities estimates, the job dimension scores produced values very similar to those reported by previous studies using the PAQ. Finally, cluster analyses of the 121 jobs suggested that the dimensions proved a viable means of grouping jobs into families. Potential users for data derived from narrative job descriptions are discussed. (Author)

AD-A108 994/5 PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
Assessing Interrater Agreement in Job Analysis Ratings.
Technical rept. May-Dec 80,
Lee A. Johnson, Allan P. Jones, Mark C. Butler, and Debbi Main. 22 May 81, 12p Rept no. NAVHLTHRSCHC-81-17

The present study explored the reliability of quantitative job analysis scores derived from detailed narrative job descriptions. Descriptions of 25 different jobs in a medium-sized military hospital were scored by four trained raters using the Position Analysis Questionnaire. Interrater agreement was assessed using a number of common indices. These indices suggested general agreement on the ratings, but differences were noted in the estimates produced. Reasons for such differences were explored and recommendations were made for avoiding potential difficulties in assessing interrater agreement on job analysis ratings. (AUTHOR)

AD-A108 997/8 PC **A04**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Integrated Avionics Manual Test Station and Component Career Ladders, AFSCs 32635A, 32655A, 32635B, 32655B, and 32675.
Dec 80, 54p

The principle purposes of this survey are evaluation of career field structure, preparation specialty training standards, and evaluation of training programs.

AD-A109 020/8 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Computer-Managed Instruction in the Navy: V. The Effects of Charted Feedback on Rate of Progress through a CMI Course.
Technical rept.,
N. H. Van Matre, H. S. Ponnypacker, W. H. Hartman, B. E. Brett, and L. Q. Ward. Nov 81, 29p Rept no. NPRDC-TR-82-16
See also AD-A096 063, AD-A092 481, AD-A096 721 and AD-A097 031.

Computer-generated progress charts were developed to provide feedback to students under computer-managed instruction. The effect of cumulative progress information on course completion time and achievement was determined through two experiments. In Experiment I, involving civilian researchers, Basic Electricity/Electronics (BE/E) students experienced five different conditions of charted feedback. A standard BE/E learning center served as control. Although no significant differences in completion times were found, student and instructor attitudes were strongly supportive of the chart procedures. Experiment II operationally applied the best procedure from Experiment I, chart-on-demand, at four CMI schools. Versions of charts for instructor use were also employed. In all four schools, students using the chart procedures completed the course in shorter time than did control students. Student and instructor attitudes toward the charts were again extremely supportive. The faster training time by students indicates the potential for significant training cost savings by widespread use of the feedback charts in Navy CMI courses.

AD-A109 146/1 PC **A03**/MF **A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
Model Extension and Computation in Goal-Arc Network Approaches for EEO Planning.
Research rept.,
A. Charnes, W. W. Cooper, A. Nelson, and R. Niehaus. Oct 81, 37p Rept no. CCS-391
Contract N00014-81-C-0236
See also Rept. no. CCS-391, AD-A095 568.

Extensions of a multi-commodity goal-arc EEO model are discussed in the context of prototype studies to check-out the model structure and computational efficiencies using PNET and other computer codes. The model, which may be considered an extension of a multi-commodity network with goals on arcs, provides for the information assistance needed after one has EEO goals to develop the strategies involving tradeoffs between internal vs. external recruitment. (Author)

AD-A109 192/5 PC **A06**/MF **A01**
Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.
Miles Training and Evaluation Test, USAREUR: Battalion Command Group Training.
Final rept. Oct 78-Jun 80,
Herbert F. Barber, and Robert E. Solick. Jun 80, 112p Rept no. ARI-RR-1290

The Multiple Integrated Laser Engagement System (MILES) Training and Evaluation Test was designed to address multiple objectives concerning improved methods of unit training and evaluation for echelons from squad to battalion. This research effort focused on command post exercises (CPX) using the Computer Assisted Map Maneuver System (CAMMS) and the feasibility of integrating CPX and field exercise techniques using CAMMS and the MILES. (Author)

AD-A109 194/1 PC **A08**/MF **A01**
International Public Policy Research Corp., McLean, VA.
A Formative Evaluation Plan for the Automated Instructional Management System (AIMS).
Research rept. Aug 79-Jan 80,
Melissa Berkowitz, Harold F. O'Neil, Jr., and Harold Wagner. Jun 80, 155p ARI-RR-1279
Contract MDA903-79-C-0558

This Research Report provides an evaluation plan to assess the Automated Instructional Management System (AIMS). The AIMS is a computer-based resource and training management system which has been procured by the Training and Doctrine Command to support its service schools and Army Training Centers. Capabilities of the AIMS include: student tracking, resource scheduling, test generation and scoring, computer-managed instruction, graduation prediction, and report generation. The evaluation plan provides for an examination of the AIMS hardware, software, courseware, training management capabilities, training effectiveness, costs, and organizational factors influencing its implementation. (Author)

AD-A109 197/4 PC **A06**/MF **A01**
WICAT, Inc., Orem, UT.
Instructional Systems Development Model for Interactive Videodisc Training Delivery Systems. Volume I. Hardware, Software, and Procedures.
Technical rept. Jul 78-Jun 79,
C. Victor Bunderson, J. Olin Campbell, and Beatrice J. Farr. Jun 80, 112p ARI-TR-511
Contract MDA903-78-C-2023

This report describes the hardware and software for videodisc training delivery systems (VTDS) and videodisc authoring and production systems (VAPS). The report describes the range of capabilities in consumer-model videodisc players and intelligent videodisc systems. It also describes the interim field test delivery system for this project that will be used the second year. The report describes VAP systems hardware, including different levels of sophistication and complexity that might be available at any Army authoring site. The videodisc production process, which uses VAP systems, is summarized and the interim authoring software to be used during this project is described. This volume provides a framework for Vol. II, the revised ISD model for videodisc development. In Vol. III, preliminary prescriptions for graphics use in videodisc authoring are given.

AD-A109 198/2 PC **A08**/MF **A01**
Litton Mellonics Systems Development Div., Arlington, VA.
Cost and Training Effectiveness Analysis in the Army Life Cycle Systems Management Model.
Final rept. 23 Apr-23 Jul 80,
Richard K. Matlick, Doris C. Berger, C. Mazie Knerr, and John R. Chiorini. 23 Jul 80, 161p ARI-TR-503
Contract MDA903-79-C-0326
Supersedes AD-A102 275.

Powerful methods applicable to CTEA and the whole manpower, personnel, and training side of acquisition via the LCSMM have been developed and await broad application and refinement. A number of these methods are described. Existing methods were weak in three areas. First, lack of adequate definition of analogous tasks degraded use of historical data from fielded weapon systems. Second, the issue of trainability (a critical question in the LCSMM) was not adequately addressed. Third TECEP, the most thorough cost model applicable in the LCSMM, did not address training in Army units. Litton's methods, devised to assist Army analysts in these three areas, is presented. The model for CTEA in the LCSMM queries the data available regardless of the point in the acquisition cycle. It is designed to answer the questions that are pertinent at each stage in the cycle. The model guided selection of methods for use by Army analysts and strategies for application of the methods. Powerful CTEA and acquisition process methods of the future, if they are real-

ized by the Army, will probably all be computer based. This feature promises not only greatly enhanced efficiency in the processing of information but almost certainly a degree of precision not now achievable. It is possible that such an increase in the efficiency and precision of information processing could both increase the effectiveness of systems and reduce the time required to acquire them.

AD-A109 200/6 PC **A04**/MF **A01**
Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.
An Investigation of the Adoption Process in Training Technology Transfer.
Technical rept.,
Jon S. Freda, and Joyce L. Shields. Jun 80, 56p
Rept no. ARI-TR-448

This study focused on the adoption process in the transfer of Army training technology from the researcher to the user. The training product chosen for this investigation was the Training Extension Course (TEC) program. A two-part survey questionnaire was completed by 111 Army participants attending TRADOC/FORSCOM Training and Evaluation Workshops. The questionnaire requested attitudinal and usage information relating to the adoption of the Training Extension Course (TEC) program by unit training managers. Sources of TEC-related information were matched with the awareness, acceptance, and utilization stages of the adoption process to help understand the dissemination activity within training technology transfer. The attitudinal responses were factor analyzed and, with selected biographic information, were entered in a regression analysis to assess the utility of these measures as predictor variables of TEC utilization. Two major findings emerged. First, the acceptance (PERSUADE stage) of the TEC program is influenced predominantly by internal sources of information (e.g., work environment), while the initial awareness (INFORM stage) and later utilization of TEC are influenced by internal and external sources (support groups, briefings, etc.). Second, prior familiarity with TEC is a better predictor of TEC usage than are attitudinal measures taken from the innovation literature (for this particular sample).

AD-A109 202/2 PC **A09**/MF **A01**
Science Applications, Inc., McLean, VA.
Personnel and Training Subsystem in an Armor System.
Final rept. Nov 79-Jan 81,
John J. Kane. 12 Jan 81, 200p ARI-RR-1303
Contract MDA903-80-C-0185

The specific purpose of this study was to conduct an audit trace of the personnel and training subsystem development of the XMI Abrams Tank System as a case study of the major systems acquisition process. From this case study lessons learned from the XMI experience have been formulated which may be helpful in developing recommendations for improving personnel and training subsystem integration in the Army Life Cycle System Management Model (LCSMM). The scope of the study was restricted to personnel and training issues which occurred between program initiation and ASARC III. Other events in the XMI development process were included only if they had a major impact on personnel and training issues or were required to make the development process comprehensible. (Author)

AD-A109 236/0 PC **A03**/MF **A01**
Colorado Univ. at Boulder. Inst. of Cognitive Science.
Encoding and Retaining Information in the Visuals and Verbals of an Educational Movie.
Technical rept.,
Patricia Baggett, and Andrzej Ehrenfeucht. Sep 81,
34p Rept no. ICS-TR-108-ONR
Contract N00014-78-C-0433

Viewers watching a narrated movie are simultaneously presented information in two media, visual and verbal/auditory. This study shows there is no competition for resources in an educational movie: when one is encoding information in one medium, one is not hindered from encoding information in the other. Even when the visual and linguistic information are presented sequentially, doubling study time, no more information is extracted than in an intact movie. College students are good dual media processors. In a sequential presentation, spoken narration first and visuals second is far inferior to visuals first and narration second. When the verbal material in a sequential presentation is read rather than listened to, order does not matter. Regarding retention, much information is extracted from linguistic material, but only half remains after a week. Less information is extracted from visual material, but it stays over a week. Practical applications are discussed. (Author)

AD-A109 251/9 PC **A03**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Reform of Current Higher Education in Communist China,
Xuewen Wang. 7 Dec 81, 27p Rept no. FTD-ID(RS)T-1268-81
Edited trans. of Chinese Communist Affairs Monthly, n6 p29-36 1980.

No abstract available.

AD-A109 310/3 PC **A02**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Program Information Digest for the Professional Designation in Cost Analysis and Price Analysis,
Ronald D. Kankey. 1981, 17p
Presented at the Department of Defense Annual Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

The Professional Designation in Cost Analysis and Price Analysis is a program offered by the Air Force Institute of Technology (AFIT), in conjunction with the Institute of Cost Analysis, to recognize those personnel in Cost Analysis/Cost Estimation, Price Analysis/Price Estimating, Program Analysis, Budget Analysis, Management Analysis, Financial Analysis, and related fields who advance their knowledge and skills through continuing professional education and who have successfully completed course teaching the approved techniques and methods of cost analysis. All personnel who apply for participation in the program and successfully complete the course requirements (grade C or better) are eligible to be awarded the designation.

AD-A109 390/5 PC **A06**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Aircraft Armament Systems Specialty AFSC 462X0.
Occupational survey rept.
Nov 81, 108p

This is a report of an occupational survey of the Aircraft Armament Systems (AFS 462X0) specialty, completed by the Occupational Analysis Branch, USAF Occupational Measurement Center in June 1980. The survey was initiated as a result of a Training and Utilization Conference in September 1979. Since the last Occupational Survey Report (OSR) was written in 1976, utilization of the 462XO resource has changed due to the introduction of the Production Oriented Maintenance Organization (POMO) concept in tactical air forces (TAF). Therefore, possible job structure and task performance changes were studied. Also, new weapons systems have been developed and training at the technical school was channelized by aircraft, beginning in January 1979 with class 790102. Thus, the feasibility of the shredout system as well as the adequacy of channelized training became concerns of the present report.

NUREG/CR-2421 PC **A07**/MF **A01**
Employment Standards Administration, Washington, DC.
Projecting Labor Demand and Worker Immigration at Nuclear Power Plant Construction Sites: An Evaluation of Methodology,
Henry W. Herzog, Jr., Alan M. Schlottmann, and William R. Schriver. Dec 81, 130p
Prepared in cooperation with Tennessee Univ., Knoxville.

The study evaluates methodology employed for the projection of labor demand at, and worker migration to, nuclear power plant construction sites. In addition, suggestions are offered as to how this projection methodology might be improved. The study focuses on projection methodologies which forecast either construction worker migration or labor requirements of alternative types of construction activity. Suggested methodological improvements relate both to institutional factors within the nuclear power plant construction industry, and to a better use of craft-specific data on construction worker demand/supply. In addition, the timeliness and availability of the regional occupational data required to support, or implement these suggestions are examined.

PB82-136599 PC **A99**/MF **E04**
Occupational Safety and Health Administration, Washington, DC.
Worker Training and Education in Occupational Safety and Health: A Report on Practice in Six Industrialized Western Nations,
Earl Heath. Sep 81, 1438p OSHA/RP-81/006

The document reports on a project carried out under a Secretary of Labor Career Service Aware during Fiscal Year 1981. The purpose of the project was to study, first-hand, worker training and education programs in job safety and health in six industrialized Western nations, and to report findings and observations which might be useful for modifying current training policies and practices within the United States. Four series of topics are addressed: (1) Background information on each country; (2) Information on the implementation of worker training and education programs in job safety and health; (3) Worker training and education programs in occupational safety and health for guest workers, non-organized workers, emplyees of small business establishments, and employees of the federal or central government; and (4) Profiles of worker training and education programs in job safety and health in construction, marine cargo handling, and in petroleum refining and related industries.

PB82-138710 PC **A17**/MF **A01**
New York State Police, Albany.
The New York State Trooper Job Element Examination.
Final technical rept.,
Robert H. Hardt, Lorraine D. Eyde, Ernest S. Primoff, and George Tordy. Jan 81, 384p NYSP-81-1
Sponsored in part by Office of Personnel Management, Washington, DC.

The final technical report describes a large-scale application of the job element method of examining which was used to select New York State Police (NYSP) Troopers. The job element examination involved a written Situations Test and a Physical Performance Test. The tests were based on the knowledges, skills, and abilities, and other qualities (KSAO's) needed to perform the activities of the job, and which identify superior performers. Both of these tests were designed to be content valid, simulating demands of the job. These objective procedures were designed to apprise the qualifications of a large number of applicants. An attempt was made to minimize the adverse impact of the written test through pretesting the Situations Questions on police recruit samples which included minority group members and by screening items for fairness both in the pretests and in the final examination. Self-ratings, based on the job requirements, were obtained from the candidates and are reported separately on the basis of race, ethnicity, and sex for subgroups varying in size from 928 for Hispanics to 17,715 for non-Hispanic white males. These data, used to corroborate the test content, may also be used to explore procedures for further reducing adverse impact.

PB82-142142 PC **A03**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Cooperative Member Responsibilities and Control.
Cooperative information rept.,
C. H. Kirkman, Jr. Mar 81, 30p CIR-1-SECT-7

Cooperative members are persons--individuals, partnerships, corporations, and associations--holding membership in a cooperative organized without capital stock or holding stock in a cooperative with capital stock. These persons are instrumental in starting or keeping the cooperative busines going because they realize they can solve their economic problems and attain their goals only by working together. Any person marketing, purchasing, or obtaining a service through a cooperative is a patron. Members filling their obligation by patronizing their cooperative are called member-patrons. Historically, members organizing farmer cooperative businesses have developed self-help methods and techniques to solve their problems and increase their net farm income. As member-owner-users, they hold membership, use the cooperative's services, and are interested in seeing that their cooperative effectively and efficiently serves them. Their objectives of service and improved net margins rather than returns on investments are the distinctive features of cooperative membership.

PB82-146226 PC **A02**/MF **A01**
Washington Univ., Seattle. Sea Grant Program.

Washington Sea Grant: A Report of Activities 1979-1980.
Annual rept.
1981, 17p WSG-PM-81-2, NOAA-81103015

During 1979-80, Washington Sea Grant supported 35 major research projects, and the results of selected projects are described in the report. Research subjects included: marine studies, coastal resources, fisheries management and assessment, aquaculture, and marine products.

PB82-151952 PC **A17**/MF **A01**
California Univ., Berkeley. Inst. of Industrial Relations.
The Impact of Rater-Rates Similarity in the Selection of Job Applicants.
Final rept. 15 Sep 80-1 Dec 81,
William . Glick. Dec 81, 390p DLMA-DD-06-80-023-1
Grant DLMA-DD-06-80-024

Selection among job applicants may be affected by similarity of rater and ratee on job-irrelevant dimensions (eg., race, sex, social affiliations, hometown), potentially leading to discriminatory hiring practices. A critical literature review indicates that the predicted positive, as well as non-significant and even negative similarity-rating relations are observed. Four social psychological models suggest different conditions for limiting or reversing the sign of the predicted similarity-rating relation. These conditions were manipulated in a simulation of the rating process using students as raters.

PB82-152935 PC **A03**/MF **A01**
National Photographic Labs., Houston, TX.
A Guide to Area Labor-Management Committees: A Manual Designed to Accompany the Film 'A Turn for the Best'.
Final rept.,
Susan G. Clark. Dec 81, 37p ARC-81-60/TX-7836
Grant ARC-81-60/TX-7836

The Guide contains an outline on how to begin organizing a Labor-Management Committee. Initial activities, ground rules for participants, goals and objectives, and working procedures for LMC's are outlined. Resource people or organizations are identified and watchful hints on pitfalls are covered. Several examples of By-Laws of LMC's are included and an appendix on Recommended Reading.

PB82-152950 PC **A09**/MF **A01**
Columbia Univ., New York. Conservation of Human Resources Project.
Metropolitan Labor Markets in Transition: A Study of Seven SMSAs - Atlanta, Denver, Buffalo, Phoenix, Columbus (Ohio), Nashville, Charlotte.
Final rept.,
Thomas M. Stanback, Jr., and Thierry J. Noyelle. Apr 81, 196p DLETA-21-36-78-33-1
Contract DL-21-36-78-33

The study identifies critical dimensions of changes in metropolitan labor markets during the 1970s. It sets forth the record as regards the combined effect of the rise of services and the process of white collarization for the U.S. labor force and discusses applicability of findings for seven metropolitan labor markets--Atlanta, Denver, Buffalo, Phoenix, Columbus (Ohio), Nashville and Charlotte--using the 10 percent sample of the Social Security Continuous Work History Sample (period 1971-1975). Differences among the seven SMSAs are identified by means of Social Security data and profiles of individual city based on field studies and relevant statistical material. Differences are found to arise from variations in cities' economic mission, industry mix and institutional structure.

PB82-156175 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
Health and Life Insurance Coverage of Local Government Employees.
Staff rept.,
Leon B. Perkinson. Nov 81, 25p AGES-811106

Local government full-time employees with health and live insurance paid for, at least, in part by employers increased considerably faster than employment between 1967 and 1977. Despite the increase in public employee coverage rates, the coverage rates in the private sector remained higher. Within the public sector, coverage rates of governmental units located within counties of the largest SMSAs were higher than the rates found for governmental units located within totally rural nonmetropolitan areas. A larger percentage of employees -- private or public, metropolitan or nonmetropolitan had health insurance coverage than had life insurance coverage.

PB82-156233 PC **A05**/MF **A01**
Fire Administration, Washington, DC.
Teaching Family Fire Safety: Nine Exhibits.
Final rept.
Oct 80, 99p FEMA-07, FEMA/FA-36

The report describes a nine-module fire safety exhibit, designed primarily for children, which was developed by the Children's Museum of Boston for the U.S. Fire Administration. The modules are: Exit Drills in the Home; The Kitchen; Stop, Drop, Roll, and Cool; What Firefighters Wear; Fire Safety Quiz; The Firehouse; Fire in the News; 'Saferway Company' Storefront; and Smoke Detectors. Construction specifications, key information, and suggested activities are included for each module. Tips for assessing the effectiveness of an exhibit are also included.

PB82-163171 PC **A08**/MF **A01**
Brandeis Univ., Waltham, MA.
Education, Occupation, and Income: The Effects of Attending a Community College on the Labor Market Outcomes of Young Men and Women.
Rept. for 1 Mar 80-31 Aug 81,
Elizabeth Monk-Turner. Feb 82, 158p DLMA-DD-25-80-005-1
Grant NCEP-DD-25-80-005
Doctoral thesis.

This study analyzes how the differentiation of higher education into sectors affects current socioeconomic status. The research focuses on the ramifications of community college education. Socioeconomic returns to level and kind of education are analyzed utilizing insights offered by human capital theory. An argument is made, however, that the significance of type of educational experience can only be adequately analyzed within a framework that allows for notions of power and conflict. Previous studies analyzing correlations between educational level and labor market outcomes virtually ignore the effects of community college attendance. Most studies focus on the value of a four-year B.A. degree, compared to a high school diploma. When less than four years of college are mentioned, all people with 1-3 years of college are lumped together regardless of whether they received a two-year degree or dropped out of a community or a four-year college. this study analyzes the two youth cohorts from the NLS.

PB82-803966 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
All Volunteer Military Services. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 320p
Supersedes PB80-815285, and NTIS/PS-79/0959.

The effects of a no-draft environment on the armed services are described in the reports cited. Problems of organization, planning, recruiting, competition with the private sector, and maintenance of standards are included. (This updted bibliography contains 333 citations, 16 of which are new entries to the previous edition.)

PB82-862244 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Equal Employment Opportunity: Women and Minorities. 1974-February, 1982 (Citations from the Management Contents Data Base).
Rept. for 1974-Feb 82.
Feb 82, 216p
Supersedes PB81-861205.

Citations in this bibliography cover studies, analyses, and reports on various aspects of equal employment opportunity (EEO) for women and minorities. Considered are many types of harassment and discrimination which are addressed by EEO. Attention is also given to economic and social impacts and to human resource development issues. (This updated bibliography contains 309 citations, 22 of which are new entries to the previous edition.)

5J. Psychology (Individual and Group Behavior)

AD-A108 813/7 PC **A06**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
A Performance Based Evaluation of Keying Logics for Alphanumeric Keyboards.
Final technical rept. Apr 80-Apr 81,
Larry C. Butterbaugh. Nov 81, 105p Rept no. AFWAL-TR-81-3104

Four keying Logics for the entry of alphanumeric characters were evaluated. The Logics were selected based on their compatibility with current keyboard designs being used for the pilot-aircraft interface involving communications, navigation, and other aircraft subsystems. Each of four groups of seven subjects learned one of the Logics and their performance was recorded on an alphanumeric keying task. Performance measures were keying speed and keying accuracy for alphabetic characters, numeric characters, character strings, and total list. A keying Logic utilizing individual keys (36) for each alphabetic and numeric character was significantly superior to other Logics which used push-button telephone type keyboards, with regard to keying time. With regard to keying accuracy, all Logics performed equally well, with an error rate of approximately 0.5 percent. Significant performance differences among the three matrix keyboard Logics were inconsistent. Of these, one utilizing the telephone arrangement was most accurate. Research is recommended to further examine keying performance in the learned state, as well as under more realistic conditions. (Author)

AD-A108 897/0 PC **A03**/MF **A01**
Naval Aerospace Medical Research Lab., Pensacola, FL.
Stimulus Determinants of Dynamic Visual Acuity. II. Effects of Limiting the Target Surround.
Interim rept.,
James E. Goodson, and Tommy R. Morrison. 25 Nov 80, 31p Rept no. NAMRL-1274
See also AD-A108 898.

Differences among laboratories regarding the magnitude and linearity of the DVA function appear to be due, in part, to variations in the configuration of the stimulus field surrounding the stimulus target. Available data do not provide an adequate basis for predicting the effects upon the DVA function of relatively simple variations in stimulus configuration. Clarification of effects of stimulus configurations surrounding the target is required if measures of DVA are to be standardized and applied to the prediction of individual capabilities, and to the development of criteria for the design of visual displays. Experiments were conducted to determine the effects upon DVA performance of limiting the illuminated area surrounding the target. Although no effect was observed when the target velocity was 20 deg/sec, the degradation in performance at 110 deg/sec was significantly increased when the target surround area was decreased. This velocity by surround interaction demonstrates the nonlinear effect upon the DVA function which may be incurred as a result of a relatively simple change in the target surround.

AD-A108 898/8 PC **A02**/MF **A01**
Naval Aerospace Medical Research Lab., Pensacola, FL.
Stimulus Determinants of Dynamic Visual Acuity. III. Effects of Proximal Borders and Limited Surround,
James E. Goodson, and Tommy R. Morrison. Mar 81, 24p Rept no. NAMRL-1276
See also AD-A108 897.

Tests of dynamic visual acuity (DVA) appear to offer unique potential for assessing practical visual capabilities. These tests have not been standardized with respect to variations in the target surround, nor are the effects of such variations understood. Goodson and Morrison have demonstrated the ease with which the DVA function may be accelerated (increased degradation as a function of target velocity) by limiting the size of the target surround. According to their acquisition hypothesis, the DVA function should be decelerated by surrounding the target with a border. The problem is to determine whether DVA performance may be degraded or enhanced by such manipulations of stimuli surrounding the acuity target. The present experiments

demonstrated that relatively simple modifications of the stimulus configuration in the target surround can affect significantly an individual's DVA performance. However, not all subjects responded to modifications of the target surround in the same manner. Implications regarding individual differences versus practice and order effects are discussed. (Author)

AD-A108 907/7 PC **A03**/MF **A01**
Delaware Univ., Newark. Dept. of Psychology.
Event-Related Potentials Elicited by Controlled and Automatic Target Detection.
Technical rept.,
James E. Hoffman, Robert F. Simons, and Michael R. Houck. Sep 81, 45p Rept no. RR-8102
Contract N00014-78-C-0762

When subjects search for the same set of targets over many trials (a training schedule known as consistent mapping or CM), performance can become relatively independent of processing load (defined as the product of the number of targets to be searched for and the number of forms in the display). Search is said to be 'automatic.' In contrast, when the role of distractors and targets is periodically exchanged, search speed is slow and highly dependent on processing load. Search occurring under these varied mapping (VM) conditions is referred to as 'controlled.' The present study attempted to determine whether the high speed search process resulting from CM training occurs without the investment of a limited capacity attention system. The P300 component of the human event related potential (ERP) has been shown to be a sensitive index of the attention required by a variety of tasks. If CM training results in a withdrawal of attention, then CM target detection should be accompanied by smaller P300's than VM detection. Subjects searched for CM and VM targets. ERP's were recorded from frontal (Fz) and parietal (Pz) electrodes both at the beginning and end of a 7 session training period. A large P300 component was observed at Pz in both search tasks with amplitude measurements independent of whether mapping was consistent or varied. In contrast, mapping was related to an 'early' component of the ERP (N1-P2). Under high processing load, a CM target produces additional negativity which may reflect orienting to the target's spatial location.

AD-A108 908/5 PC **A03**/MF **A01**
Delaware Univ., Newark. Dept. of Psychology.
The Nature and Role of Attentional Resources in Controlled and Automatic Detection.
Final rept.,
James E. Hoffman, and Billie C. Nelson. Sep 81, 34p Rept no. RR-8103
Contract N00014-78-C-0762

A series of experiments examined the role of attentional resources in automatic detection by pairing a consistently mapped visual target detection task with a series of concurrent discrimination tasks. The pattern of intertask interference suggested that automatic detection requires two distinct kinds of resources. The occurrence of automatic visual targets produces a shift of the visual spatial attention system to the area of the target. This reallocation of attention enhances the visual representation of the target and any other forms within the attention field. Subjects do not have complete control of this process since automatic targets disrupt performance on the concurrent task even when subjects are instructed to ignore them. In addition to the spatial attention system, automatic detection requires use of comparison processes in working memory. Even partial attention to a secondary task delays the occurrence of the overt detection response suggesting that decisions on two concurrent tasks must occur in working memory in a serial fashion. Converging evidence from an event-related potential (ERP) experiment supports this conclusion. The magnitude of the P300 component of the ERP, which indexes decision making in working memory, was found to be similar for both controlled and automatic detection tasks. Extensive training in detection tasks does not result in a skill that is 'resource-free'. The main function of consistent-mapping training may be to refine the triggering conditions for the application of limited perceptual resources. (Author)

AD-A108 928/3 PC **A02**/MF **A01**
California Univ., San Diego, La Jolla. Center for Human Information Processing.
The Timing of Endpoints in Movement.
Technical rept.,
Michael I. Jordan. Nov 81, 21p Rept no. 8104
Contract N00014-79-C-0323

The issue of temporal control of motor behavior was investigated using a rhythmic tapping task. It was found that: (1) subjects are better able to tap before a beat than after a beat; (2) the variability of tapping depends on whether the subject is attempting to tap on, before, or after a beat; (3) the control of rhythmic tapping is relatively central; (4) the starting times of taps are more variable than the ending times. These results are interpreted in terms of a model by Wing (1980), and their significance for theories of timing is discussed. (Author)

AD-A109 019/0 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Event Related Brain Potentials and Cognitive Processing: Implications for Navy Training.
Interim rept. Oct 79-Sep 80,
Gregory W. Lewis, Pat-Anthony Federico, Jeffrey N. Froning, and Marlene Calder. Oct 81, 32p Rept no. NPRDC-TR-82-8
See also AD-A068 087, AD-A037 339, AD-A085 030.

This report describes the evaluation of a relatively new technology, the analysis of event related brain potentials (ERPs), as a possible means of improving Navy training. The subjects were 50 Navy recruits undergoing basic military training. Eight channels of visual, auditory, and bimodal ERP data were recorded for each subject from scalp contact electrodes. Microvolt standard deviation amplitude measures were computed. During the same test session, but not concurrently, a battery of cognitive style, aptitude, and ability paper-and-pencil tests were given to the subjects. The subjects were clustered into two groups, or types, based on the paper-and-pencil tests. Type 1 subjects represented a spatial processing group, while Type 2 represented a 'verbal processing' group. (Recent research indicates that the left hemisphere processes primarily verbal, analytic and sequential information, while the right hemisphere processes spatial, integrative or simultaneous information.) ERP variates were input to discriminant analysis to differentiate the two groups. No visual or bimodal ERP variates discriminated or validated the classification matrices. Auditory ERP variates differentiated ($p < .01$) and validated ($p < .005$) the two groups. Greater amplitude asymmetry areas were found with visual stimuli for the spatial group and with auditory stimuli for the 'verbal' group. Greater sensory interaction was found in the right hemisphere for the 'spatial' group and in the left hemisphere for the 'verbal' group. (Author)

AD-A109 021/6 PC **A03**/MF **A01**
Rehab Group, Inc., Falls Church, VA.
Certain Places Pay: Current Inconsistencies and Suggested Alternatives.
Technical rept. Sep 79-Jun 80,
Josh Dorsey, Richard King, Murray Rowe, and Mark Chipman. Nov 81, 26p NPRDC-TR-82-17
Contract N00123-80-D-0591
See also Rept. no. NPRDC-TR-81-1, AD-A092 726.

Certain Places Pay (CPP) is provided to enlisted personnel serving at specified locations outside the contiguous United States as a morale factor and in recognition of the greater-than-normal rigors of service at such locations. Because the CPP rates have not changed since 1949, the pay has declined from about 10 percent of basic pay to less than 2 percent currently. To assist OP-01 in making or supporting informed decisions designed to improve the CPP system, this effort evaluated the cost, effectiveness, and administrative burden of the existing CPP system relative to a set of six alternative pay schemes. (Author)

AD-A109 043/0 PC **A03**/MF **A01**
Logistic Command (DoD), Melbourne (Australia).
Psychological Aspects of Camouflage Design and Detection: Stress and Visual Information Processing.
M. G. King, G. D. Burrows, and G. V. Stanley. Sep 81, 30p

The visual detection of a concealed target involves the interaction of object characteristics and observer-related variables. This report briefly summarises object characteristics which may affect detectability, and then concentrates upon observer variables. Some of the physical limitations of the human optical system are mentioned. An information processing theory is reviewed and adopted as a model upon which some hypotheses are based. In the case of a search of a large, complex field, automatic processing of information may lead to the selection of likely target areas, however controlled search processes may be required to scan the information in an automatically selected array.

AD-A109 130/5 PC **A03**/MF **A01**
Decisions and Designs, Inc., McLean, VA.
A Friendly Personal Decision Aid.
Technical rept.,
Scott Barclay, Robert M. Esoda, Cynthia L. Cox, Cameron R. Peterson, and Jonathan J. Weiss. Dec 81, 31p Rept no. TR-81-12-312.43
Contract MDA903-80-C-0194, DARPA Order-3831

Early efforts to produce decision aids, although they led to valuable research findings, did not succeed as field applications. Even when the targeted users agreed that the computer-aided decision process did improve decision making, these aids eventually fell into disuse when the personal support of the decision analysts was removed. User attitudes tended to be dominated by the short-range considerations of speed, convenience, and simplicity of operation, rather than by the long-range factors such as methodological thoroughness and consistency. The primary goal of this research project was to develop a prototype version of a user-friendly decision aid which could be used by persons with little or no prior training. This decision aid was not only designed to be easy to use, but also to save time and fit into the user's office or field site, while still providing the benefits of a technically sound decision-analytic approach. Since then, a prototype system has been developed, and a working model has been delivered to DARPA. This report is intended to accompany that working model. Its function is to document the purpose of the research effort, the technical approach, accomplishments of the project, and the prognosis for future development based on lessons learned during the effort. Because of the aid's self-explanatory nature and its unique hardware configuration, neither a users guide nor a system manual is needed.

AD-A109 141/2 PC **A12**/MF **A01**
Tennessee Univ., Knoxville. Dept. of Psychology.
Efficient Methods of Estimating the Operating Characteristics of Item Response Categories and Challenge to a New Model for the Multiple-Choice Item.
Final technical rept. 1 May 77-30 Sep 81,
Fumiko Samejima. Nov 81, 251p
Contract N00014-77-C-0360

This is the final report for the research contract N00014-77-C-0360, which started on May 1, 1977, and ended on September 30, 1981. It systematizes major findings of the research, and gives perspectives and directions of future research. (Author)

AD-A109 179/2 PC **A03**/MF **A01**
Colorado Univ. at Boulder. Inst. of Cognitive Science.
How an Unfamiliar Thing Should Be Called.
Technical rept.,
Patricia Baggett, and Andrzej Ehrenfeucht. Nov 81, 33p Rept no. TR-111-ONR
Contract N00014-78-C-0433

An empirical method is described to derive good names for unfamiliar objects. Three principles were used in deriving the names: (1) The vocabulary and structure of the names should be within the user's linguistic capacities; (2) The names should be informationally efficient, namely, short, but at the same time unique; and (3) The names should form a classification system. For example, most names have a generic term and one or more modifiers. These principles lead to the following design for creating good names: Step 1; Names are generated by a group of subjects. Step 2: From the names generated by subjects, the experimenter chooses a subset of the names according to the following criteria: (a) the modal name is chosen, namely, if a particular name is generated more often than others, it is chosen; (b) shorter names are preferred; (c) names chosen stay within the classification system provided by the subjects. Step 3: How good the names are is tested by measuring (1) how well people can match the names with the objects they describe; and (2) how well they can recall the names, given the physical objects. Steps 2 and 3 can be iterated; namely, if a given name is poorly matched or recalled, it can be replaced by another generated name and tested again. The method results in names that form a

classification system and that are natural, short, well matched with their physical referents and well recalled.

AD-A109 326/9 PC **A03**/MF **A01**
Klein Associates, Yellow Springs, OH.
Training Requirements Analysis for Tactical Domains.
Final technical rept. 1 Jun 79-30 Sep 81,
Gary A. Klein. Nov 81, 43p Rept no. TR-81-39-5
Contract F49620-79-C-0179

The goal of this research program was to develop and test a model of proficient performance. Three aspects of proficient performance were studied: recognitional capacities, perceptual learning, and the use of analogies. We studied the use of analogical reasoning for generating predictions in technological environments. Three models of analogical reasoning were considered and rejected. The first is the standard a:b::c:d model employed by test-makers. The second stems from the use of analogical reasoning to generate new scientific hypotheses. Seven Air Force engineers were interviewed; all had used comparison cases as analogues for the task of predicting reliability of subsystems for the B-1. Neither model was able to account for the performance of the engineers. A third model claims that analogical reasoning is based on similarity matches, and is probabilistic. This model was rejected on conceptual grounds -- the processes it relies on are inadequate for the task. To replace these models, we developed a new theory of analogical reasoning, showing its basis in standard forms of deductive logic. We also were able to define the conditions under which analogical reasoning will generate formally valid conclusions. This work is relevant for any area in which comparisons play an important role, such as the domain of technological improvement involving design changes in automobiles, aircraft, etc. The research performed has implications for a number of applied areas, such as the development of methods for generating predictions under conditions of uncertainty, the design of programs for training personnel to reach high levels of proficiency, and the development of automated decision aids to support experienced C2 personnel.

PB82-163452 PC **A13**/MF **A01**
National Heart, Lung, and Blood Inst., Bethesda, MD.
Patient Compliance to Prescribed Antihypertensive Medication Regimens: A Report to the National Heart, Lung, and Blood Institute.
Final rept.
Oct 80, 284p NHLBI-80-305, NIH/PUB-81-2102
See also PB82-163460 thru PB82-163544.

The chapters of this report are selective, in-depth reviews by the members of the Working Group on Patient Compliance with Antihypertensive Treatment. In the reviews, results of the eleven (11) National Heart, Lung, and Blood Institute (NHLBI) projects published up to mid-1980 are incorporated into the broader scientific literature on patient compliance to provide the reader with an up-to-date perspective on patient compliance with antihypertensive treatment.

PB82-163486
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
A Review of Tested Interventions for Improving Compliance with Antihypertensive Treatment,
R. Brian Haynes. Oct 80, 27p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p83-111 1980.

No abstract available.

PB82-163494
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
Medical Compliance and the Clinician-Patient Relationship: A Review,
Thomas F. Garrity. Oct 80, 23p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p113-137 1980.

No abstract available.

PB82-163502
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
The Role of Social Support in Patient Compliance: A Selective Review,
Rona L. Levy. Oct 80, 23p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p139-163 1980.

No abstract available.

PB82-163528
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
Ethical Considerations in the Development and Application of Compliance Strategies for the Treatment of Hypertension,
Robert J. Levine. Oct 80, 18p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p229-248 1980.

No abstract available.

PB82-163536
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
A Review of Preliminary Intervention Results from the National High Blood Pressure Education Research Program. Appendix I,
Thomas F. Garrity. Oct 80, 17p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p249-267 1980.

No abstract available.

PB82-163544
(Order as PB82-163452, PC **A13**/MF **A01**)
National Heart, Lung, and Blood Inst., Bethesda, MD.
National High Blood Pressure Education Research Program Grants: Reference Information. Appendix II.
Oct 80, 16p
Included in Patient Compliance to Prescribed Antihypertensive Medication Regimens, p269-284 1980.

No abstract available.

SHR-0007294 PC **A10**/MF **A01**
Simi Valley City Dept. of Human Resources, CA.
Evaluation for Informed Decision-Making. City of Simi Valley, 1977.
1977, 222p

This manual presents a step - by - step method for collecting and analyzing policy - relevant data for decisionmakers so that a professional research team will not be required. The evaluation process may be used to assess one program or to compare programs. The first phase invoives determining the purpose of the evaluation, clarifying goals, establishing procedural and financial criteria, and recruiting evaluation commission members, interviewers, etc. In the second phase, preparations for plan implementation -- including pretesting questions, briefing interviewers -- are made. The evaluation itself is discussed in terms of assessing the collected data and issuing the final report. The system includes a set of data collection instruments, a criteria scale, and a variety of checklists to guide the user through each of the tasks. The manual is organized into sections separating each of the three basic phases. Within these sections, each individual task is fully explained. At the end of each of the task descriptions is a series of simulation exercises. The manual envisages a team effort involving the decisionmaker, evaluator, agency representative, interviewers, and evaluation commission members. Sample workplans, survey instruments, 11 references, and tabular data are provided.

5K. Sociology

AD-A108 936/6 PC **A03**/MF **A01**
United States International Univ., San Diego, CA. Family Research Center.
Family Separation and Reunion, A Style of Life in the Military.
Interim rept.,
Edna J. Hunter, and Robert A. Hickman. 15 Sep 81, 40p Rept no. USIU-TR-81-04
Contracts N00014-79-C-0519, MIPR-49-0042
See also AD-A093 811.

Military family separation invariably requires that the family adjust to change imposed by the absence of the parent. The resulting stress has often been reported in the literature. But just as separation brings stress to the military family, the members experience still added stresses when father returns. In the past policies of the military organization regarding family separation and reunion have been insensitive to the family's needs. However, in recent years families are being afforded increasing supportive social services during these periods of family disruption. (Author)

AD-A108 937/4 PC **A03**/MF **A01**
United States International Univ., San Diego, CA. Family Research Center.
Military Wife Adjustment, An Independent Dependent.
Interim rept.,
Edna J. Hunter, Barbara Melissa Gelb, and Robert A. Hickman. 1981, 29p Rept no. USIU-TR-81-05
Contracts N00014-79-C-0519, MIRP-79-0042
See also AD-A093 811.

The military organization provides security for the nation; similarly the security and psychological health of military personnel often rests with the family -- particularly the wife. Thus, her personal and emotional adjustment is crucial. Although past studies abound in dysfunctional coping responses of wives to stresses of military living, underscored also in much of the literature are the remarkable resiliency and adaptability of these wives, who are truly independent 'dependents'. (Author)

AD-A109 337/6 PC **A02**/MF **A01**
Military Academy, West Point, NY.
Ethics and the Military Profession. Assumptions of the Honor Concept.
Nov 81, 12p

In April 1978 the United States Military Academy's Committee on Ethics and Professionalism began its publication of Ethics and the Military Profession. Since that first issue, the publication has presented topics such as 'The NCO and the Professional Ethic,' 'Sports and the Military,' and 'Values and the Professional Soldier.' The purpose of this journal is the stimulation of dialogue and research among West Point Staff and Faculty in topics that would assist in the integration of Ethics and Professionalism courses with the cadet experience. This issue of the Ethics and the Military Profession makes a modest attempt to consider the multiple and often conflicting demands of honor. The topic is admittedly difficult and open-ended, but it is of vital interest to us as professionals and as the instructors of future professionals. Since the purpose of this journal is the discussion of issues that will promote the integration of ethics and professionalism, response to this issue and suggestions for further discussion are welcomed.

HRP-0903746/6 PC **A09**/MF **A01**
Southeastern Massachusetts Regional Planning Committee, Middleboro.
Regional Plan for the Prevention, Intervention and Treatment of Alcohol Abuse and Alcoholism in Southeastern Massachusetts, Health Service Area V, 1980.
Jun 81, 193p
Sponsored in part by Alcoholism Providers Association of Southeastern Massachusetts, Inc., Lakeville.

The first regional plan for alcoholism services in Southeastern Massachusetts is the product of a collaborative planning process which involved providers and consumers and representatives of the planning and regulatory sectors. Each of the five major factors that has shaped this first regional plan are reviewed: historical development; Regional and Planning Committee composition; Federal, state and regional initiatives; planning development perspectives; and plan limitations. The plan focuses on the following; health promotion and health protection (primary prevention and driver alcohol education); ambulatory care; acute care; long term care (short-term intensive rehabilitation and recovery home). The implementation of primary prevention involes the gradual shifting of responsibility for preventive care and health maintenance from the health care provider to the individual concerned. The risk associated with personal behavior is examined: alcohol non-use; use; misuse; abuse; and alcoholism. Primary prevention services are classified into four categories: information to provide awareness building; education to provide attitude building; training to provide skill building; and assessment to provide indicators of growth development. Specific topics included in these four categories are alcohol education, alcoholism education, and health promotion concepts.

HRP-0903799/5 PC **A06**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Proceedings of the Symposium on Sheltered Living, June 21, 22, 1979.
Dec 79, 112p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

A symposium was held in June 1979 on the topic of sheltered living. It brought together individuals with experience in caring for the functionally disabled elderly, the physically handicapped, the developmentally disabled, and representatives from such fields as mental health and architectural design. Task groups considered service definitions and needs, program development, facility construction and conversion, standards and quality of care, legislation and regulatory bodies, funding, and personnel training. Task group reports identified services necessary to make sheltered living a viable option, such as congregate housing, communal living, emergency and temporary placement, home-delivered meals, homemaker and home health aide services, transportation and escort services, emergency repair of functional equipment, emergency medical equipment, transition services, case management, regionalized resource information, life skills training, crisis intervention, and short-term psychiatric emergency care. Recommendations were made for a centralized agency to make individual assessments, train personnel, list desirable aspects of training, make design and facility standards for the construction and conversion of sheltered living units, regulate and fund sheltered living units, and devise program and service standards. Supplementary information on the symposium and the form participants used to evaluate their attendance are appended.

HRP-0903834/0 PC **A05**/MF **A01**
New York State Health Planning Commission, New York.
The Medically Indigent; Policy Responses in the 1980s.
May 80, 92p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Public health programing and financing for the economically disadvantaged are addressed in this 1980 conference proceedings report. The conference was sponsored by the New York State Health Advisory Council and included over 100 health care professionals who represented government agencies (Federal, State, and Local), public and private health care facilities, third-party insurers, and consumer groups. Conference participants discussed policy responses in the 1980's to the medically indigent, patient and provider perspectives on the problem, legislative and fiscal perspectives, New York State's policy in financing indigent care, the role of cost sharing and competition in an Oregon health project, school health in Massachusetts, the private insurance system, public entitlements, and deficit financing of providers. The conference's final session consisted of five policy workshops where participants discussed potential solutions to the medically indigent problem.

PB82-137878 PC **A08**/MF **A01**
Battelle Law and Justice Study Center, Seattle, WA.
The Government Executive's Guide to Arson Prevention and Control: A Handbook on Information Systems and Action Programs.
Final rept.,
Clifford L. Karchmer, Mary V. McGuire, James Greenfield, and Karen Robinett. Nov 81, 169p
Contract FA-80025

To assist top-level government leaders, such as majors and city managers, in better coordinating and planning arson prevention and control activities. Direction over such programs is moving from fire and police agencies, which have traditionally been responsible, to a diverse mix of other agencies concerned with mental health, juvenile delinquency, and housing. For this reason, the government executives responsible for coordinating multi-disciplinary programs need an information base upon which to develop and implement coordinated programs. The Government Executive's Guide provides technical information on arson early warning and information management systems, juvenile firesetter programs, methods to prevent revenge arson, and the relationship of housing economics to residential arson. The guide also contains resource directories and technical bibliographies to assist the reader in obtaining additional information.

PB82-140039 PC **A03**/MF **A01**
Congreso Nacional de Arquitectos (Panama).
Economic Factor in the Habitat (La Condicionante Economica en el Habitat),
Rovi Fong, Julio Isaac, and Alvarado Espino. Oct 79, 27p
Text in Spanish. Paper presented to the National Congress of Architects (2nd) in Panama.

Departing from the development of Panama, once a forest, owing to the creativity of the people who used the few natural resources they had, the author describes what the people deprived of economic means do, as well as what the companies with them can achieve. The land architecture in Poro-Poro is quoted as an example of what people with low income can do using their resources and some appropriate technologies, such as land, plants, water, winds, level conditions, economical construction systems, utilization of shade, and fish ponds.

PB82-140682 PC **A04**/MF **A01**
Battelle Law and Justice Study Center, Washington, DC.
Model Curriculum and Trainers' Guide: The Detection and Investigation of Arson-For-Profit Schemes.
Final rept. 1980-81,
Clifford L. Karchmer. Aug 81, 52p
Grant LEAA-80-CJ-AX-0086

Arson-for-profit is committed by rational, calculating criminals who seek to derive an economic benefit from their illicit activities. This model curriculum and trainers' guide provides step-by-step assistance in the development of specialized training programs. Bibliographic references which instructors can use for course readings are included, as well as a roster of national organizations that can provide assistance in the development of specific courses.

PB82-142654 Mag Tape $665.00
National Center for Health Statistics, Hyattsville, MD.
Vital Statistics Mortality Multiple Cause Data, Detail, 1971.
Data file,
Harry Rosenberg, and Joseph D. Farrell. 1971, mag tape NCHS/DF-81/021
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes desired for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB81-117046, and PB82-142662.

Vital Statistics data relating to mortality provide demographic, underlying and multiple cause-of-death data for deaths occurring during the calendar year. The data are based on information abstracted from all death certificates filed in vital statistics offices of each State and the District of Columbia. Death is defined as the permanent disappearance of any evidence of life at any time after live birth, therefore, data relating to fetal deaths are not included in the data. Demographic data include variables such as date of death, age, race, sex and geographic area. Underlying cause-of-death data and multiple cause-of-death data have been coded to the causes shown in the Eighth Revision of the International Classification of Diseases, Adapted for Use in the United States. Death and infant mortality rates and/or denominators required to derive such rates are not on the tapes. The number of deaths and the death and infant mortality rates for selected demographic and cause variables are published annually in Vital Statistics of the United States, Volume II, Parts A and B. A technical appendix giving information regarding the historical aspect and limitations of the data is included in the published volumes and the documentation for the data tapes. Specialized reports are published periodically in Vital and Health Statistics. Multiple cause-of-death data at the each cause level of detail is included as Appendix I of the multiple cause-of-death documentation.

PB82-153214 PC **A06**/MF **A01**
Russell (Harold) Associates, Inc., Waltham, MA.
Performance Standards for Protection and Advocacy Systems for the Developmentally Disabled (Volume II).
Final rept.
15 May 80, 118p AASHD-78-16-2
Contract DHEW-105-78-5002
See also PB82-153206.

Under amendments to Developmental Disabilities Services and Facilities Construction Act of 1970, and the Mental Retardation Facilities and Community Health Centers Construction Act of 1963, states were required to have in effect by October 1, 1977 a system to protect and advocate for the rights of persons with developmental disabilities. Chapter I describes the methodology and design specifications used in the development of the P&A performance standards through the examination of performance standards characteristics, the presentation of the methods used to identify, review, screen, and adapt existing performance standards, the strategy for the development of new performance standards, and the way in which the existing performance standards and the new performance standards were integrated into a cohesive set of P&A standards. Chapter II, presents the Performance Standards Review Process, and Chapter III, a User's Manual.

PB82-156514 PC **A14**/MF **A01**
California Univ., Berkeley. Social Research Group.
Report on the 1979 National Survey,
Walter B. Clark, Lorraine Midanik, and Genevieve Knupfer. Dec 81, 313p NIAAA/NCALI-82-1
Contract PHS-ADM-281-77-0021
See also PB82-156522 thru PB82-156589.

Papers presented in this report on the 1979 national alcohol use and problem survey are the products of a research program that began in September 1977. Respondents who participated in this study were chosen by probability methods to represent adults aged 18 years and older, living in households within the 48 continguous states. In these papers, the following topics are addressed: (1) results of the 1979 survey; (2) research issues concerning problems associated with drunkenness in women; (3) research on alcohol use and alcohol problems; (4) history of surveys on alcohol use and drinking problems in general populations; (5) alcohol use in various settings; (6) life events and problem drinking; and (7) alcohol problems and depressive symptoms. Details of the study sample, fieldwork operations, and the contents of the survey questionnaire are appended.

PB82-156522
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Alcohol Use and Alcohol Problems Among U.S. Adults: Results of the 1979 National Survey,
Walter B. Clark, and Lorraine Midanik. Dec 81, 54p
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p4-57 Dec 81.

No abstract available.

PB82-156530
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Problems Associated with Drunkenness in Women: Some Research Issues,
Genevieve Knupfer. Dec 81, 39p
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p57-97 Dec 81.

No abstract available.

PB82-156548
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Notes Toward Research on Alcohol Use and Alcohol Problems,
Walter B. Clark. Dec 81, 25p
Contract PHS-ADM-281-77-0021.
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p98-121 Dec 81.

No abstract available.

PB82-156555
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
A Very Brief History of Surveys on Alcohol Use and Drinking Problems in General Populations,
Walter B. Clark. Dec 81, 25p
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.

Included in Report on the 1979 National Survey, p122-146 Dec 81.

No abstract available.

PB82-156563
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Alcohol Use in Various Settings,
Walter B. Clark. Dec 81, 24p
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p147-170 Dec 81.

No abstract available.

PB82-156571
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Life Events and Problem Drinking,
Genevieve Knupfer. Dec 81, 13p
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p171-183 Dec 81.

No abstract available.

PB82-156589
(Order as PB82-156514, PC **A14**/MF **A01**)
California Univ., Berkeley. Social Research Group.
Alcohol Problems and Depressive Symptoms,
Lorraine Midanik. Dec 81, 136
Sponsored in part by National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
Included in Report on the 1979 National Survey, p184-310 Dec 81.

No abstract available.

PB82-159021 PC **A05**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Innovative Approaches to Understanding Transportation/Societal Interactions. Volume 1 - Program Overview and Executive Summaries.
Final rept. Jun 79-Jun 80.
Oct 81, 86p DOT-TSC-UMTA-81-61-1, UMTA-MA-06-0039-81-1
Contract DTRS-57-80-C-00032
See also PB82-159039.

In 1979, the Transportation Systems Center (TSC), under sponsorship of the Urban Mass Transportation Administration (UMTA), began a program of research directed toward improving the understanding of the role of transportation in society, in particular with respect to patterns of travel, location, and development. As a major element of the program, innovative approaches to defining, structuring, or solving the problems were sought from the research community. This report contains seven study design reports prepared by six research firms who were awarded contracts to produce detailed work plans for refining and demonstrating proposed innovative analytic approaches to understanding transportation/societal interactions. The seven approaches and corresponding contractors are: (1) Cambridge Systematics - Residential Housing and Location Model; (2) DAA Enterprises - Systems Dynamics Model; (3) Futures Group - Probabilistic Systems Dynamics Model; (4) Interchange - Analysis of Demography, Housing, and Transportation; (5) Interchange - Micro-Economic Model; (6) Research Triangle Institute - Comparative Analysis of Urban Spatial Structures; and (7) University of Illinois - Societal Linkages Model.

PB82-159039 PC **A99**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Innovative Approaches to Understanding Transportation/Societal Interactions. Volume 2: Study Design Reports.
Final rept. Jun 79-Jun 80.
Oct 81, 737p DOT-TSC-UMTA-81-61-2, UMTA-MA-06-0039-81-2
Contract DTRS-57-80-C-00032
See also PB82-159021.

In 1979, the Transportation Systems Center (TSC), under sponsorship of the Urban Mass Transportation Administration (UMTA), began a program of research directed toward improving the understanding of the role of transportation in society, in particular with respect to patterns of travel, location, and development. As a major element of the program, innovative approaches to defining, structuring, or solving the problems were sought from the research community. This report contains seven study design reports prepared by six research firms who were awarded contracts to produce detailed work plans for refining and demonstrating proposed innovative analytic approaches to understanding transportation/societal interactions. The seven approaches and corresponding contractors are: (1) Cambridge Systematics - Residential Housing and Location Model; (2) DAA Enterprises - Systems Dynamics Model; (3) Futures Group - Probabilistic Systems Dynamics Model; (4) Interchange - Analysis of Demography, Housing, and Transportation; (5) Interchange - Micro-Economic Model; (6) Research Triangle Institute - Comparative Analysis of Urban Spatial Structures; and (7) University of Illinois - Societal Linkages Model.

PB82-862863 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Delphi Method Used in Forecasting. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 186p
Supersedes PB80-809312.

This bibliography contains citations concerning the Delphi Method as used in forecasting, arriving at a consensus or in polling opinion for a large range of questions. Modifications of the basic approach, analyses of the validity of the results, and suggestions for improvements are considered. (This updated bibliography contains 138 citations, 10 of which are new entries to the previous edition.)

SHR-0006147 PC **A05**/MF **A01**
Human Resources Planning Inst., Inc., Seattle, WA.
Quality Satisfaction Instrument (A Guide for Measuring Service Quality Through Consumer Satisfaction). Volume I.
Sep 78, 78p
See also related document, Volume II, SHR-0006148.

The Quality Satisfaction Instrument (QSI) described here was designed to help federally assisted providers of social services for the elderly in the measurement of the consumer satisfaction component of program quality. Tested and validated questionnaires for services in the areas of nutrition, transportation, outreach, health screening, information and referral, and home services are included. Unvalidated questionnaires for other areas as well as information on developing further instruments are also provided. These instruments may be used in conjunction with an instrument which measures a program's adherence to existing professional and technical standards. Used together, the instruments can provide a more extensive overview of service delivery quality. The instruments are especially useful in providing information on a continuing basis through repeated surveying. The QSI enables program administrators to measure progress in meeting service goals and the needs of consumers, to develop graphic and statistical indicators of service changes, and to gain reliable information for future planning and improvement. Each questionnaire is a simple, one - page instrument which is easy for consumers to understand, easy to administer, easy to score by persons with no statistical background, and highly reliable over time. The manual and its appendices also provide guidelines for usage or adaptation; data evaluation; sample selection; the selection, training, and supervision of interviewers; and the preparation of an interviewers' handbook.

SHR-0006148 PC **A04**/MF **A01**
Human Resources Planning Inst., Inc., Seattle, WA.
Quality Program Instrument (A Guide for Measuring Professional/Technical Standards of Program Quality). Volume II.
Sep 78, 74p
See also related document, Volume I, SHR-0006147.

The Quality Program Instrument (QPI) described here was designed to help federally assisted providers of social services to the elderly in the measurement of a program's adherence to existing professional and technical standards. The QPI was developed for the service areas of nutrition, transportation, outreach, health screening, information and referral, and home services. Although the questionnaires have not yet been validated, preliminary tests indicate that they are effective tools for measurement. The QPI may be used in conjunction with a quality satisfaction instrument which measures consumer satisfaction in order to provide a more extensive overview of service delivery quality. The instruments are especially useful in providing quality information on a continuing basis through repeated surveying. As an adjunct to the QPI, a management checklist has been included to provide administrators with detailed standards of service quality. This will allow them to compare their program to the one described in the checklist and assess their program's consistency with these technical standards. All the information necessary to administer the QPI, either as a separate component or integrated with the quality satisfaction instrument, is presented in an introductory section. Another section discusses how to use the information generated by both instruments to measure total program quality. Examples are presented of various methods for graphically displaying comparisons of program quality, to aid administrators in program planning and modification.

SHR-0006282 PC **A03**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
START Center Evaluation.
Jun 78, 36p

Findings are reported from an evaluation of Florida's Short Term Adolescent Rehabilitation Treatment Centers (START), a treatment program for juveniles that emphasizes understanding oneself and one's relationships with parents, peers, and environment for the purpose of developing more socially acceptable and responsible living patterns. The core of the treatment program is daily "reality therapy" group meetings with trained leaders, who are also available for individual counseling. An educational program is designed to increase options for the youth by providing employability skills and enhancing academic achievement. The prototypical START Center houses 25 males or 20 females and is located in a suburban or rural area. Evaluation data were obtained from (1) a computerized data file that includes basic demographic variables and information on the commitment, placement, and subsequent movement of all committed youth; (2) information collected from the annual evaluation of youth services education programs in the training schools and START Centers; (3) aftercare information available from case review forms; and (4) central commitment files, which were checked for recidivism information since furlough. Placements for the 4 - month study period (January through April 1977) were 53 percent female and 47 percent male, with the average client being 15.4 years of age. About one - third of the placements were black youth. Twelve months and 18 months after furlough, the recidivism rates were approximately 18 and 32 percent, respectively. Findings show that first - commitment youth are more likely to complete the program. Overall, the center's are a stable cost - effective component in the array of treatment services for youth. Monitoring to maintain and improve program and aftercare quality is the evaluation's main directive. Tabular data are provided.

SHR-0006283 PC **A02**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Eckerd Wilderness Camps Evaluation.
Jun 78, 22p

Findings and policy implications are discussed from an evaluation of Florida's Eckerd Wilderness Camp program for youth with emotional problems. The four Eckerd Wilderness Camps, administered by the Jack and Ruth Eckerd Foundation, are located throughout Florida, and they work on a contract basis with the Florida Department of Health and Rehabilitative Services to provide services to 105 youths yearly. These youths are sent to the Department as delinquents and are believed to have emotional problems. Budgeting allows each youth to be in the wilderness program for 1 year, in keeping with the youth's specialized service needs. Five groups, each composed of 10 youths and 2 counselors, design, build, and maintain their own campsites. The campsites consist of sleeping facilities, a washup area, and a kitchen shelter for preparing and eating meals on the camp cooks' days off. Much of the camp activity focuses on self - evaluation, camp maintenance, and planning for trips. No formal education program is included until the last few months of the campers' stay. Learning is believed to occur through an "experience curriculum." Sources of evaluation data were (1) the computerized data file, which includes basic demographic variables and information on the commitment, placement, and subsequent

movement of all committed youth; (2) information on aftercare available from case review forms; and (3) the youth services central commitment files, which were checked for recidivism information since furlough. Data showed that the recidivism rate, following 12 months of furlough, was 47 percent. Recommendations are offered for improved followup after being furloughed from camp. Tabular data are provided.

SHR-0006284 PC **A03**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Intensive Counseling Evaluation.
Dec 78, 29p

Findings are reported from an evaluation of Florida's intensive counseling program -- a nonresidential component of the small community - based programs offered by the Florida Department of Health and Rehabilitative Services Youth Services for the rehabilitation of juvenile delinquents. Eight to 10 youths compose a counseling group. Each group is staffed with one counselor. Group sessions are the principal treatment mode, and counselors are required to enforce attendance and evaluate group effectiveness. Counselors are expected to verify the truth and validity of group discussions by contacting parents, teachers, employers, law enforcement officials, and other persons who may have knowledge of the youth's behavior when he / she is not in the group. This information is used to determine if behavioral changes noted in the group are resulting in positive behavior in the community. Parents of the group members attend a parent group once a week. The sources of evaluation data were (1) a computerized data file containing demographic variables and information on the commitment, placement, and subsequent movement of all committed youth; (2) information on aftercare available from care review forms; and (3) the central commitment files, which were checked for recidivism information since furlough. When compared with all youth services commitments during the same time period, the intensive counseling placements were more likely to be male (92 percent versus 84 percent) and older (16.4 years versus 15.6 years). Racial and offense characteristics were similar to those of the general committed population. Twelve months after furlough, the recidivism rate was 26 percent, with this same rate also holding after 18 months. Overall, it appears that the program represents a stable, cost - effective component in youth services treatment programs. Monitoring to maintain and improve the program is the main directive of the evaluation. Tabular data are provided.

SHR-0006285 PC **A03**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Project STEP Evaluation.
Jun 78, 27p

Findings are reported from an evaluation of Florida's Short Term Elective Program (STEP) -- an outdoor educational program that teaches wilderness survival skills to provide juvenile delinquents with development of self - reliance and a sense of self - worth. Established through a contract with Outward Bound, the program consists of canoeing from the Atlantic Ocean through the Okeefenokee Swamp to the Gulf of Mexico. Following the trip, there is a debriefing phase that provides guidance and support for each youth during community reintegration. The evaluation data were obtained from (1) a computerized data file that contains basic demographic variables and information on the commitment, placement, and subsequent movement of all committed youth; (2) information on aftercare available from case review forms; and (3) the central commitment files, which were checked for recidivism since furlough. Eighty youths were placed in STEP from January through April 1977. The average age of clients was 16.3 years, with all admissions being males and one - third being black. The majority (58 percent) had been charged with property offenses. Twelve months following furlough, the recidivism rate was 28 percent. STEP compares well with other types of programs on success measures, in that only 11 percent of admissions do not complete the program. Due to the necessity of receiving children only during the limited intake periods, most youths are admitted to STEP as transfers, adding to the total cost of treatment. A low - cost holding facility for youths awaiting admission to STEP might be feasible. A policy of home detention might also prove workable for some youths who could be accepted into STEP at the beginning of the project's next cycle following their commitment. Tabular data are provided.

SHR-0006287 PC **A03**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Evaluation of Intake Detention Practices and Detention Services.
Oct 78, 44p

Findings are reported from an evaluation of Florida's use of juvenile detention, the characteristics of detained youths, and the use of alternatives to secure detention. Primary sources of data were the detention population analyses, the intake data card, and the detention data card. In 1977, 24.3 percent 24.3 percent of the 105,821 delinquency cases referred to intake statewide were detained, with an increasing trend in the use of detention through the first quarter of 1977. The rate dropped through the remainder of the year, but was up again for the first two quarters of 1978. Of the juveniles detained, 77.2 percent were male and 22.8 percent female. Black juveniles were slightly more likely than other races to be detained, and the likelihood of detention increased slightly with age. The rise of secure detention populations in the last few years, despite the existence of the nonsecure detention program, should be of concern. Only when stringent criteria are used to limit the types of children detained can the nonsecure program be expected to reduce secure detention populations. Efforts are needed at the local level to facilitate earlier admission of children into nonsecure programs, since lengthy stay in secure custody defeats the purpose of the nonsecure program. Implementation of statewide detention screening training for intake workers is needed (a training package developed for this purpose will begin in January 1979). Tabular data are provided; 53 footnotes are listed.

SHR-0006447 PC **A16**/MF **A01**
Association of Idaho Cities, Boise.
Impact of the Local Self Government Act of 1976 on the Human Services Delivery System in Idaho.
Jan 78, 370p

This project identified areas of Idaho's human services system which could potentially be affected by a city's exercising of its home rule authority under the State's Local Self Government Act of 1976. Before the passage of this act, a combination of Federal and State statutory authorities maintained control over Idaho's human services, and cities could perform only those functions which the State's constitution or laws had specifically authorized. The new act (House Bill 422) allows cities to exercise any power and perform any function or service not prohibited by the constitution and laws. This report explains that to provide input and establish better services for municipal residents, city officials may best use these new rights by participating on policy and advisory boards, especially for those programs that have a significant impact at the local level, such as income maintenance programs (Aid to Families with Dependent Children, Old Age Assistance, medicaid, and food stamps). Of the social insurance programs, unemployment insurance offers the best opportunity for city participation because it is a State - operated program, and city participation on advisory boards and councils of the State's Department of Health and Welfare could enhance control over social service programs, including title XX, the Work Incentive Program, day care, and the programs under the Law Enforcement Assistance Act. State and district advisory board participation may also represent the most effective means for affecting the provision of health services. A review of local involvement in other States demonstrates that, in most cases, the predominant factor precipitating entry into the human service field has been difficulty in obtaining service from fragmented programs. Local efforts in a number of areas are outlined. An extensive review of relevant statutes is appended.

SHR-0006476 PC **A03**/MF **A01**
Brooke Army Medical Center, Fort Sam Houston, TX.
Characteristics and Management of Child Abuse and Neglect Among Military Families.
Sandra Maley Schnall. Sep 77, 37p
Grant OHD-90-C-576
Paper presented to the Military Family Research Conference, San Diego, California, September, 1977. Part of the Texas Dept. of Human Resources Child Advocacy Resources Expansion Project.

This report presents the results of a survey, conducted by the Child Advocacy Resources Expansion Project, of the characteristics and management of child abuse and neglect cases among military families in the San Antonio, Tex., metropolitan area. The survey was conducted to help establish a sufficient data base for the military environment. Between October 1, 1976 and April 30, 1977, each new case of suspected child abuse and neglect in military families reported to the five area military installations or to the Texas State Department of Human Resources was included in the research sample. Cases were followed through closure to gather complete data on case disposition, services needed and provided, and military and civilian resources used. The results showed that 195 military families were reported to child protection personnel. One - half (97) were established as cases of abuse or neglect; and of these, active duty military families were involved in 84 percent and retired families in 16 percent of the cases. Further, officer personnel were involved in 13 percent of the established cases. Of the 157 victims, 22 percent were less than 3 years old, and 27 percent were between the ages of 12 and 18. Medical examinations and treatment were provided for 27 percent, while half of these required hospitalization. The biological parent was identified as responsible for 78 percent of the cases, and males abused children almost three times as often as females did. A high level of family stress was frequently noted in these cases. Legal action was taken in 15 percent of the cases; and among these, 27 percent of the children were placed out of the home. Furthermore, the intervention of the military sponsor's commanding officer was necessary in 26 percent of all cases. A long - term career impact on the abusers was impossible to determine. The civilian child protection agency served as the initial point - of - entry for two - thirds of the referrals, and civilian protective services workers made the initial social work contact in 72 percent of the cases. Though they constitute about 20 percent of the city's population, military families were involved in only 11 percent of the total referrals during the study period. Further studies are recommended. Data tables, graphs, case histories, and a five - item reference list are included.

SHR-0006477 PC **A05**/MF **A01**
Brooke Army Medical Center, Fort Sam Houston, TX.
Child Advocacy, Abuse, and Neglect. Procedures Manual.
Frances W. Killebrew. 4 May 78, 93p
Grant OHDS-90-C-576
Part of the Texas Dept. of Human Resources Child Advocacy Resources Expansion Project.

This procedures manual, developed by the Child Advocacy Resources Expansion Project, aims to provide a uniform and consistent approach to the handling of child abuse and neglect cases and to other child advocacy efforts. Although the procedures were originally designed for use in the operation of child advocacy programs at two military medical centers in Texas, they may be modified to serve as an effective program on any military installation or in any hospital. An early section reviews the purposes of social work assessment in child abuse and neglect cases and presents the rationale for selecting a clinical social services model. Another section presents a family data sheet which may be used to collect referral information, to serve as a case record face sheet, and to provide a source for the collection of research data. A case work flow sheet is included, designed to provide an overview of a family's service needs, to serve as a tracking form for the request of collateral services reports and therapeutic intervention, and to provide a source for the collection of research data in the area of contributory factors and in case management. A further section contains an outline for the intake and assessment of case information, and another reviews intake, assessment, interview, and case recording guidelines. Since the presentation of a case to a group requires the abbreviation of material contained in the case record, one section provides an outline for the succinct presentation of factual information, the psychodynamic analysis, and intervention suggestions. Other sections include a statement for parents entering the child advocacy program; a chronological log of referrals, a numerical code for various types of abuse and neglect, and guidelines for the use of the child care center. Discussion also focuses on monthly report forms, the organization of military abuse and neglect prevention programs, and patient flow charts developed at the two military medical centers. Numerous sample forms are included.

SHR-0006487 PC **A05**/MF **A01**
New Jersey State Dept. of Health, Trenton. Alcohol, Narcotic and Drug Abuse Unit.

New Jersey Combined Alcohol and Drug Abuse Prevention and Treatment Plan, 1981.
1981, 83p

Progress through May 1980 and plans for fiscal year 1981 are presented in this New Jersey State plan for alcohol and drug abuse prevention and treatment programs, with emphasis on strategies to cope with reductions or elimination of Federal funding and an increase in the availability and use of heroin. An introduction presents data supporting the conclusion that heroin availability and use have been growing in New Jersey and discusses the need for a dynamic management approach to accomplish restructuring of funding for treatment and nontreatment services. A section describing the current systems presents such information as an organizational chart, a profile of the individuals involved in 80 alcoholism programs in New jersey during 1979, a discussion of countermeasures being used to combat the problem of drinking drivers, and a list of licensed residential alcohol treatment facilities. Performance reports for 1980 for the Division of Alcoholism and the Division of Narcotic and Drug Abuse are next presented. Alcoholism treatment service needs in the areas of nonhospital detoxification, halfway houses, and residential treatment are summarized. Program action plans regarding alcoholism and drug abuse present 1981 goals and objectives, resource assessments, and action strategies. The final section presents financial reports and budgets. Tables are provided.

SHR-0006737 PC **A04**/MF **A01**
Department of Health, Education, and Welfare, Washington, DC. Office of the Secretary.
HEW Secretary's Task Force on Hospice.
Dec 78, 70p

This is the report of the 1978 DHEW Hospice Task Force on the status of the hospice movement in the United States. The effect of current policies, statutes, and regulations on hospices and appropriate roles for the Federal Government are examined. American hospices are categorized into five types: (1) freestanding hospices, (2) freestanding hospices with a hospital affiliation, (3) hospice units within a hospital, (4) hospice teams within a hospital, and (5) home care only. Admissions criteria, the role of professionals and volunteers, case management, and financing issues are outlined. Special problems -- such as pain management and emotional support for patient, family, and staff -- are also discussed. DHEW activities include a National Cancer Institute 3 - year demonstration contract with Hospice Inc. of New Haven, Conn., to develop and implement an at - home care continuum for cancer patients whose disease cannot be cured or controlled. Selected projects and roles of the following agencies are reviewed: the Health Care Financing Administration (HCFA), the National Institute on Aging, the Bureau of Medical Services, and the Health Resources Administration, among others. Anecdotal cost data indicate a nationwide savings equivalent to $1 million annually for using hospice care rather than hospitalization. The Federal response may include integration of hospice care into the existing health delivery system, community health services, and home health programs, among others. Financial support for construction and training may also be possible. Nonfinancial assistance could begin with endorsing the hospice concept. Finally, the Federal Government could develop both technical expertise and standards and certification procedures. A total of 30 footnotes are provided.

SHR-0006827 PC **A05**/MF **A01**
Alabama Univ., University. School of Social Work.
Children in Need of Supervision (CHINS): A New Concept in Alabama Law.
Mary R. Lewis. 1977, 90p
JJJP-WP2-77.

This report describes youth affected by a provision in the Alabama Judicial Code called CHINS -- Children in Need of Supervision. It addresses the personnel in Alabama's public and private agencies at all levels, such as judges, juvenile probation officers, child welfare workers, social workers in youth - serving agencies, juvenile law enforcement personnel, school personnel, mental health counselors, and community leaders who have responsibility for explaining the new law to others and enforcing it. A child in need of supervision may be classified as a status offender. A national perspective of the juvenile status offender problem is given, along with characteristics (sex, race, age, urban - rural comparisons) of Alabama status offenders for 1975 and 1976. The current concept of diversion in juvenile justice is discussed in relation to the Alabama criminal justice system. Community - based programs are compared with institutional programs in terms of recidivism rates. The legal argument that juveniles have a right to treatment is reviewed, and it is suggested that standards be set to determine adequacy of treatment. Specific recommendations are made for implementing the new law. They include the development of adequate diagnostic facilities for the purpose of assessing whether status offenders need intensive counseling primarily, or whether they also need skills development programs. Alternative approaches suggested are the use of community - based treatment facilities or a combination of coordinated services. Appendices include data regarding juvenile courts, juvenile offense referral ratios, and judicial dispositions. Tabular data, notes, and about 70 references are given.

SHR-0006828 PC **A06**/MF **A01**
Boston Coll., Chestnut Hill, MA. Graduate School of Social Work.
Social Services in Occupational Settings: A Study of Eight Companies.
Martha Fortune, Nancy Goldberg, Felise Llano, and Mary Niemela. Dec 80, 109p

Findings and recommendations are presented from a study having the following objectives: (1) to describe the obstacles to developing an employee assistance program (a company - sponsored counseling program for individual employees); (2) to examine company incentives for establishing an employee assistance program (EAP); (3) to describe various types of EAP models; (4) to examine the roles of public and private systems in relation to the development of EAP's; and (5) to make recommendations on the role of the Health Planning Council for Greater Boston (HPCGB) in regulating, planning, and implementing EAP's in occupational settings. The research consisted of a literature review of background information in the areas of health insurance, health - care costs, industry and cost - containment measures, EAP's and the health promotion movement. Open - ended telephone interviews with representatives of the human service system investigated the components of the systems network to demonstrate how human service agencies, health providers, insurers, and regulatory agencies interrelate and influence the delivery of EAP services in the workplace. Interviews with appropriate persons in a sample of eight companies were the major source of data collection. It was found that company data on EAP's and health promotion were poor in the areas of comparability, consistency, and availability; and EAP's varied significantly in the range of services offered. The existence and strength of linkages between industry and the human services network was found to be the most significant factor in the development and effective operation of company EAP's. The study recommends that the HPCGB become more involved with companies and the human services network in providing technical assistance for the development and improvement of EAP's and other occupational health promotion activities. Research instruments and supplementary information are appended, and a bibliography of 42 citations is provided.

SHR-0007170 PC **A04**/MF **A01**
Minnesota State Planning Agency, St. Paul. Human Resources Planning Unit.
Energy Policy and the Elderly. Minnesota's Elderly in the 1990's.
Technical paper
Val Jensen, and Cynthia Koeck. Mar 81, 74p

This report, which is part of a larger study of Minnesota's elderly population and long - range planning vis - a - vis the elderly, examines the potential impact upon the elderly of a market - based energy policy. There are indications of a growing acceptance of a market - based energy policy, which will rely primarily upon market forces to determine the supply, price, and allocation of energy resources. The costs of relying upon such a policy will be borne disproportionately by low - income persons. In 1975, the income of households headed by elderly persons was found to be 39 percent less than that of nonelderly households. This, in turn, affects the quality of housing in which the elderly live. Further, the elderly suffer from health problems to a greater extent than the nonelderly, thus creating a significant additional expense. An individual's ability to afford heat is directly related to income and the characteristics of his / her housing. The elderly are also limited in their ability to conserve heat, because their susceptibility to illness and hypothermia (abnormally low body temperatures) requires that adequate levels of heat be maintained for health purposes. It appears inevitable that a market - based energy policy will produce energy prices which will exceed increases in incomes for the elderly. Also, as fuel prices increase and households substitute gas, electricity, or propane for oil, there will be less incentive for fuel oil suppliers to stay in Minnesota. This will hurt rural areas in particular, since they are heated primarily by fuel oil. The overall impact of declining supplies of energy to the State, combined with increased energy prices, could significantly slow the State's economic growth, which would in turn reduce the State's capacity to assist low - income households with energy - related problems. There is a strong indication that there will be few alternatives for mitigating the effects of rising energy prices on the elderly poor except through existing income security policy. Program summaries and a bibliography are appended, and tabular data are included. (Author abstract modified).

SHR-0007209 PC **A04**/MF **A01**
Crossroads Mental Health Center, Creston, IA.
Assessment of Community Mental Health Needs in a Rural, Low-Income Area.
Shirley N. Lischer, Larry D. Chase, Neal L. Kane, and Betty P. Schutt. May 78, 54p

This report describes the methodology and findings of a 1977 - 78 needs assessment project which surveyed residents of nine rural counties in southwest Iowa regarding their mental health needs and attitudes toward mental illness. Because research has shown that statistics on the socioeconomic status of an area can be correlated to mental health problems, demographic data was first compiled from the 1970 census. This information revealed that the nine - county area had a high concentration of elderly residents, a high level of poverty, and a high proportion of of people over 18 who had not completed high school. County residents' attitudes toward and awareness of mental health services were assessed through structured interviews with 65 community leaders and questionnaires distributed to various groups and organizations throughout the area; 805 persons responded. Since information for the counties was very similar, the findings of both surveys are presented for the area as a whole and then compared with State and national statistics. Both community leaders and residents believed that child neglect and abuse, unsolvable marital problems, and drinking were the primary causes of mental health problems. Most respondents stated that mental illness could be prevented, but answers to other questions indicated deeply held stigmas associated with mental health problems. While residents were poorly informed about the availability of community health services, most felt that additional services were needed at the local level. Support for the development or expansion of mental health information and education services ranged from 90 to 94 percent. Contrary to what is assumed by local government officials, the majority favored accepting Federal and State funds for mental health programs. Recommendations are presented, along with seven references, statistical tables, the structured interview form, and the survey questionnaire.

SHR-0007260 PC **A05**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Measurements of Program Performance and Management.
Dec 80, 84p

This report provides an overview and assessment of the performance during fiscal year 1979 to 1980 of Florida's youth services programs, including secure and nonsecure detention, community control and furlough services, and commitment programs. Official data compiled by the State's Youth Services Program Office or by local agencies were used as the basis for the report. For each program, information provided includes a program description, list of program locations, population profile, movement / management information, effectiveness measures and results for program processes, and costs. Findings indicated that youth services programs performed reasonably well when viewed as a system. Overall utilization rates for community - based commitment programs were good. The secure detention program experienced some overutilization during the year, but the figures were lower than those for previous years. The attention home component of the nonsecure detention program experienced

great difficulty in contracting allocated beds and keeping them occupied. Youths also remained on community control caseloads for an average of 2.3 months longer than the 6 - month standard and on furlough 2.5 months longer than the standard. The racial distributions within some commitment programs were not consistent with racial proportions of the overall commitment population. Training school populations were reduced during the year, in part because of increased use of community - based programs and a slight decrease in the length of stay. A high percentage of children from commitment programs received honorable terminations from subsequent furlough supervision. Transfer rates from youth services commitment programs to more restrictive programs showed substantial improvement over previous years, as a result of policy guidelines and monitoring by district and State personnel. Footnotes and extensive tabular data are provided. (Author abstract modified).

SHR-0007261 PC **A03**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Evaluation of the ARK Program for Retarded Offenders.
Apr 80, 44p

This report evaluates the results and costs of a Florida program designed to provide community - based residential treatment for mildly and moderately retarded juvenile offenders. The ARK program, which admitted its first clients in April 1979, was originally designed to deinstitutionalize retarded delinquents charged with nonviolent offenses. The treatment model consists of a six - bed residential group home and two to four satellite community placement beds that are scheduled to become operational during the program's second year. The satellite beds are for current clients whose behavior has improved but who will have no appropriate aftercare alternatives. During the program's first 11 months, 28 referrals were made for placement at the ARK, with 22 of these being admitted as new clients. None of these clients were successfully released to the community during the period studied; however, the original program proposal projected that the average length of stay would be 1 to 2 years. Despite the variety of referral sources, the referral process was hampered by a shortage of eligible referrals, although other data indicated that many more youths were eligible for the program. Five of the six clients who were eventually released from the program were unsuccessful transfers, which produced an in - program failure rate of 45 percent. The distinguishing characteristic of the unsuccessful transfers was their prior violent offenses. Thus, the program was found to be ineffective for clients with a prior record of violent behavior, and such clients should not be admitted in the future. Assessment of clients' progress in personal and social skills showed that clients increased knowledge and skills in several areas of personal and social life functioning and reduced the frequency of maladaptive behavior. Program costs per day per child were much higher than the budgeted costs because of the limited volume of clients and the problems caused by admitting youths with a history of violent behavior. The actual costs would have been below the budgeted amount if the program had been utilized at full capacity. Tables and an appendix presenting forms used in the ARK program are provided. (Author abstract modified).

SHR-0007262 PC **A05**/MF **A01**
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Planning Coordination Unit.
Updated Preliminary Evaluation Report of Resource Reallocation.
15 Nov 80, 100p

This report describes and evaluates a Florida project to divert offenders from unnecessary penetration into the juvenile justice system by shifting resources to levels of programming more commensurate with a delinquent's presumed degree of risk. The program was funded to begin on October 1, 1979, in three districts of the State. Funds provided from the transfer of a training school to the Department of Corrections were distributed to such services as an increased intake staff, a network of diversion programs, and probation work programs. The program was intended to achieve a sequential reduction in community control caseloads, commitments, and training school population. The increased intake staff was expected to improve the quality of services provided. However, from April through July 1980 in two of the districts, the majority of intake recommendations to the State attorney were below established quality standards. The quality of recommendations in the other district has improved only slightly since the program's inception. The rate of court - imposed sanctions decreased in all three districts, although the pattern was not uniform among the districts. The number of referrals to the Juvenile Alternative Services Project was 42 percent below the projection; this low utilization may inhibit subsequent anticipated paths of change and the achievement of the ultimate goal. In one district a majority of the youths referred to the alternative services project were inappropriate referrals that could have been more efficiently and effectively sanctioned by their parents or intake. The 8 months of the program's operation is not enough time to determine whether the program will succeed in achieving its ultimate goal. However, the results in two of the districts provide support for the underlying theory of resource reallocation. Figures, tables, and appended tabular data and charts are provided. (Author abstract modified).

SHR-0007295 PC **A08**/MF **A01**
Urban Inst., Washington, DC.
Shades of Gray: A Portrait of the Elderly in Five Metropolitan Areas.
Michael Gutowski, and Madeleine Kimmich. May 81, 158p
Research Paper.

Data are provided on the demographic, economic, housing, and neighborhood characteristics of the elderly in five metropolitan areas: Boston, Mass.; Detroit, Mich.; Atlanta, Ga.; Portland, Maine; and Phoenix, Ariz. Major trends and policy issues related to the elderly are discussed, based on comparative analyses of the data for the five areas. The main data sources for the study were the Annual Housing Surveys from 1974 to 1976. The five cities chosen for the study reflect the diversity in American cities. Findings show that the suburban elderly population is growing faster than the central city's elderly population in both absolute and relative terms. By the end of the century, the same proportion of elderly residents will live in the central city as in the suburbs. Older people currently live in older houses and do not move as often as younger households. On the average, the suburban elderly have higher incomes and educational levels, better housing, and higher rates of home ownership than do the central city elderly; however, neither group of elderly is homogeneous. Efforts to channel scarce public and private resources to those most in need should be based on an understanding of the variability in relevant characteristics among the central city and suburban aged. Characteristics of social service delivery vary considerably across the five areas examined. For example, Phoenix and Atlanta have centralized Area Agencies on Aging, while the other three cities have multiple local agencies. Moreover, methods used to perform needs assessments and to allocate title III funds also vary. More central city than suburban dollars are spent for transportation, home repairs, adult day care, and health screening. Suburban spending focuses more on home health services, legal services, outreach, and counseling. Transportation is a particularly critical problem for the elderly. Among policy implications of these findings are that the needs of selected groups must be considered, renters warrant special attention, and transportation and home maintenance are two service areas that appear to need more attention in the suburbs. In addition, the graying of suburbia indicates the need to plan and use public facilities, such as schools, for people in all stages of the life cycle. Charts, tables, and appendices presenting maps and numerous data tables are provided.

SHR-0007385 PC **A05**/MF **A01**
Community Service Society of New York, NY.
Case for Action Now: Strategic Planning to Offset the Anticipated Program Cuts of the Reagan Administration.
1981, 76p
This paper was originally prepared in January, 1981 for the New York City Task Force on Human Services Crisis.

Federally supported human service programs are analyzed for their current legislative and budget status, political adherence to Reagan administration policy, and vulnerability to Reagan's program cuts. The proposed elimination of many categorical grants in favor of expanded block grants is also evaluated. The following programs are now highly vulnerable under the Reagan administration's proposed budget cuts: the Comprehensive Employment Training Act (CETA) programs (need reauthorization), the Food Stamp program (current appropriation insufficient to cover this fiscal year), the School Breakfast and Lunch program (because of their relationship to the Food Stamp program), health planning (on continuing budget resolution), Community Health Centers (on continuing budget resolution), followthrough (needs reauthorization), mental health services, and Section 8 and Section 312 housing programs (administration bias against categorical assistance). Certain programs are less vulnerable either because their funding has already been advanced or secured, constituent support is strong (services for senior citizens and Head Start), or they are already funded by block grants (community development and title XX social services). Also, Federal support for health and nutrition programs for targeted groups of women, infants, and children appear in less jeopardy. Fact sheets on each of these programs contain a brief description of their services and clients, appropriations, vulnerabilities to Reagan's policies, and possible advocates.

SHR-0007387 PC **A02**/MF **A01**
Community Service Society of New York, NY.
Status Report on the Impact on New York City of President Reagan's Proposed Budget Cuts.
15 Apr 81, 15p

President Reagan's proposed budget cuts, which may adversely affect New York City, are delineated, and their legislative status as of April 1981, is indicated, along with a description of the impact on New York City should each proposed budget cut be approved by Congress. Each State program listed is followed by a description of the proposed Reagan cuts, the status of Senate action, the House Budget Committee recommendation, and the impact on New York City should the proposed cut be approved. Programs are categorized under the broad areas of employment, income security, education, health and nutrition, social services, housing, community development, transportation, and justice. The report is directed toward community groups and individuals concerned over the budget cuts.

SHR-0007455 PC **A06**/MF **A01**
Florida Consortium for Research and Evaluation, Tampa.
Trust of Evaluation: A Guide for Involving Citizens in Community Mental Health Program Evaluation.
Joan Wagner Zinober, and Nancy R. Dinkel. 1981, 111p

This manual provides guidance for involving citizens in the evaluation of community mental health programs, and is intended for staff and governing board members of community mental health centers (CMHC's) undertaking such a project. The opening section presents background and general procedural information on citizen review groups (CRG's). Reasons for involving citizens in public agency planning and evaluation are reviewed, and non - specialist involvement in evaluation is discussed. Experiences with CRG's are described to illustrate some of the principles presented, and basic procedures and variations for developing CRG's are discussed. The second section focuses on aspects of the CRG development process that require special attention. Issues discussed include how to decide on the variation in the CRG process that will be best for a particular CMHC; how to decide what type of citizen to recruit; how to recruit group members; and how to establish a cohesive group in a short time. Advice on how to make sure the citizens receive and understand enough information to be productive, and how to follow through on the CRG process is also given. Recommendations are offered for avoiding various difficulties likely to occur. The appendix lists and describes Federal legislation affecting the development of the CMHC program, and two references and seven selected readings are provided, along with a glossary. (Author abstract modified).

SHR-0007651 PC **A05**/MF **A01**
National Science Foundation, Washington, DC.
Alabama's Juvenile Status Offenders: A Pilot Study.
Mary R. Lewis. Aug 80, 76p

A pilot study was conducted in one urban county and one rural county in Alabama to develop and pretest a method for studying the factors that influence decisionmaking about youth referred to Alabama juvenile courts for running away, being truant from school, or being beyond parental control. The pilot study was preceded by an analysis of the historical development of youth services in Alabama, of the 1975 legislation sep-

arating status offenders from other offenders, and of availability of youth services in the State. The study sample included all 60 youths in the 2 counties who were referred for the 3 status offenses between January 1 and April 30, 1978. Two very different patterns of organizations interacting with youth were discovered in the two counties. The rural county's judge decided on a case - by - case basis how to work with the relevant agency, while the urban judge reached a prior agreement with the agency director regarding responsibility for each type of case. Data from agency records revealed that 49 of the 60 youths were known to the agency at some time and 42 were known before the status offense referral to court. However, more than a third of the families had not sought help from any source. MAXPEN, a variable representing the level of penetration of the juvenile justice system, was defined. Variables that were significantly related to MAXPEN included the following: being white and female, frequency of running away from home, distance run, number of referrals to court, age of the head of the household, and having violence in the home. Among problems identified in the current system were geographical variations in dispositions, the system's inability to deal with the family problems that were often closely linked with the youth's problems, and lack of services in many jurisdictions. Policy implications, footnotes, tables, an appendix listing types of organizational decisions made about status offenders, and a list of 27 references are provided. (Author abstract modified).

SHR-0007737 PC **A02**/MF **A01**
Maryland Dept. of Health and Mental Hygiene, Baltimore.
Casemanagement: Who Needs It and What Is It.
Stanley R. Platman. 14 Dec 79, 10p
Talk given by the author at the Case Management Workshop on December 14, 1979, Baltimore, Maryland.

This address reviews the history of social care for the disabled and deviant and recommends a new organizational scheme for case work management of deinstitutionalized clients. A new attitude toward mental health services emerged in the 1950's, advocating community treatment and causing a shift of the institutionalized population to less restrictive environments. This approach has given rise to criticism because it has resulted in the accumulation of neglected and unwanted individuals in urban communities, where they are incapable of caring for themselves. This failure has enhanced historical stigmas and undermined the credibility of treatment systems. The chronically mentally ill need a range of health, mental health, and social services that are provided by many agencies among whom coordination is difficult. Thus, an agency in each geographic area should be designated to assume responsibility for ensuring that every chronically mentally disabled person's needs are met through case management services performed by trained personnel with interpersonal skills, familiarity with the chronically mentally disabled, and knowledge of community resources. The best arrangement for implementing this recommendation is to place generic support responsibilities on the social services system, with the case manager representing a separate agency that is part of the Department of Human Resources rather than the Department of Health and Mental Hygiene. This separation manager from the direct provision of mental health treatment allows the manager to coordinate the multiple needs of chronically disabled clients and provide advocacy in such areas as income maintenance, housing, education, rehabilitation, transportation, leisure time activities, and friendship.

SHR-0008285 PC **A06**/MF **A01**
Emerge, Inc., Boston, MA.
Emerge: A Men's Counseling Service on Domestic Violence: Organizing and Implementing Services for Men Who Batter.
1981, 101p
National Clearinghouse on Domestic Violence Monograph Series.

This publication reports on the structure, operation, and rationale for Emerge, an all - male collective organization in Boston, Mass., founded in 1977 to combat domestic violence, particularly against women. The primary service of the organization is to provide counseling for men who batter. Also undertaken are community education efforts and training for public and private agency staff involved with the problems of domestic violence. Emerge's membership currently consists of 19 men; their activities are performed with regular consultation with women active in Boston's victim shelters. The report introduces the problem of battering through a review of the literature and a presentation of Emerge's perspective. The latter is characterized by the principle that a serious attack on woman abuse must include an equaling of power relationships between men and women on a personal as well as on a social level. Another of Emerge's principles is the readiness to challenge traditional stereotypes of "appropriate" male behavior. The counseling methods reported are discussed in terms of their applicability to work with abusive men, and Emerge's community education program is described, with emphasis on its preventive goals. In assessing the future directions of the organization, attention is given to the necessary transition from the group's self - help beginnings to an organization with paid staff and wide - ranging activities. Appended are sample forms, illustrative counseling dialogues, partner contact guidelines, and a discussion of the relationship between alcohol and battering and of the concept of organizational collectivity. A national directory of services for men who batter is also provided.

SHR-0008522 PC **A02**/MF **A01**
Midwest Regional Resource Center, Des Moines, IA.
Parent-School Partnership: An Analysis of the State-of-the-Art of Service Delivery and Technical Assistance Activities Provided to SEAs and LEAs Under P.L. 94-142. Resource Report No. 2.
Nona M. Flynn. Feb 80, 19p

To assist in the development of a functional parent - educator relationship, this report identifies and analyzes issues regarding the parent - school partnership and recommends solutions. With the passage of Public Law 94-142, The Education for All Handicapped Children Act of 1975, the parent has been given the opportunity to ensure the best interest of a handicapped child by assuming a place beside the educator as an equal partner in the educational process. State Regional resource centers (RRC's), demonstration projects, and national services agencies were contacted to identify current activities and the need for future activities related to enhancing parent involvement. The current activities are in training, information / product dissemination, and technical assistance / consultation. Parents and educators expressed concern over their lack of preparation for their new role as equal partners in the educational planning process, their lack of conviction that the benefits of parental involvement are equal to the efforts expended, and other issues. Two directions or solutions are proposed: a coordinated comprehensive awareness information / campaign regarding the parent - school partnership and a partnership training approach at the State and local level. The potential role of the State RRC's as a resource for an awareness campaign as well as a training effort is evident. The centers could provide a blueprint for a multiagency campaign. Overall, although Public Law 94-142 assigned new roles and relationships to parents and educators, few have successfully implemented a functional parent - school partnership. About 30 references and a resource list are supplied.

SHR-0008669 PC **A03**/MF **A01**
Wisconsin Dept. of Health and Social Services, Madison. Program Analysis Section.
DHHS Employment and Training Programs: A Background and Issue Identification Paper.
Charles Brotz. Aug 81, 45p

This paper summarizes the employment programs operated by Wisconsin's Department of Health and Social Services (DHHS) in the divisions of corrections, community services, vocational rehabilitation, and economic assistance. The paper first presents a general overview of the nature and extent of the unemployment problem and the governmental policies directed toward solving it. Next, a framework or classification system for distinguishing between the various types of employment programs is described. This analytical framework permits a review of the economic theory and policies upon which the department's policies are based. In the final section of this report, the 19 employment - related programs administered by DHHS are examined. Information on the history, purpose, and objectives of each program is given, along with data on the target population and eligibility factors, services provided, staffing, funding, and administrative organization. Issues and policies of current interest are also reviewed. Among the programs in corrections are work release, study release, adult work experience, youth work experience, transitional employment, purchase of service, and Wisconsin corrections industries. Community services include the Senior Community Services Employment Program, Refugee Resettlement Program, Work Incentive, Displaced Homemaker Center, grants for employment of developmentally disabled persons, sheltered employment, and title XX education and training. Title I - B basic services, homecrafts, and workshop for the blind constitute the vocational rehabilitation category. The Relief to Needy Indian Persons Work Experience Program represents the department's efforts in the area of economic assistance. Tabular data are provided.

SHR-0008670 PC **A09**/MF **A01**
Wisconsin Dept. of Health and Social Services, Madison. Bureau of Evaluation.
Child-Specific Residential Treatment Evaluation Model.
Mary Henning. Jun 80, 185p

This report documents a 1979 - 1980 effort to develop and pilot test a model for evaluating residential treatment for children. The model presented in the report is child - specific and includes measurement of long - term goals and short - term objectives that are concrete and observable. Long - term change is measured using a standardized test or checklist, and short - term change is measured in five different program goal areas: psychosocial, academic, family, vocational, and physical functioning. Problems in the program goal areas are the major reasons why children are referred to residential treatment. These referral reasons are to be determined in conjunction with the referring worker, as are the long - term goals for the child and the estimated length of stay. Multiple measurement increases the likelihood that the change observed actually did occur. Use of time - series data permits attributing change to the treatment intervention. The model was wholly or partially tested in 8 of 30 Wisconsin institutions of child care. Reactions of six of the directors of participating institutions are presented. Their overall response was favorable; however, the directors expressed a need for technical assistance in implementing the model, in statistical analysis of the data, and in data processing. The evaluation data generated by this model will enable the institution staff to compare their performance in the current period with previous periods and will help them set goals for future performance. In addition, a model was developed though not tested, to show how to obtain meaningful program cost information to use in conjunction with evaluation data. The human services taxonomy of the Wisconsin Department of Health and Social Services is featured in the evaluation and the cost models. Recommendations are to require and / or provide incentives for implementation of the child - specific evaluation model in child caring institutions in Wisconsin and to identify a unit within the Division of Community Services to coordinate institution - related activities and to manage the child - specific evaluation. It is also recommended that the cost model be pilot tested. Tabular data and 15 references are given. Appendices contain analysis of data from the child behavior checklist and the time - series data.

SHR-0008698 PC **A05**/MF **A01**
Wisconsin Dept. of Health and Social Services, Madison. Human Services Developmental Section.
Human Services Development Series: Case Management in Selected Wisconsin Counties.
Louise Dybdal. Sep 80, 83p

This document describes case management efforts as a tool for improving services delivery in 11 counties of Wisconsin, including Eau Claire, Taylor, Racine, Jefferson, Columbia, Brown, Chippewa, Wood, Washington, Douglas, and Outagamie. It is intended to be a guide / compendium for use by these and other counties as they consider adding or modifying their case management approaches. Three case management models are presented, involving these components: case assessment, service planning, referral and services requisition, and monitoring and information systems. Case management costs are also considered. The paper discusses such case management issues as the provision of direct services by case managers, the question by the agency, if case management should be provided to all clients, and if case managers should be specialists or generalists. The paper also considers the information systems needs of case management and what happens when multiple agencies providing case management serve the same client. The document suggests that counties follow certain process steps as they explore case management options: assessment, information gathering, design, cost / benefit

analysis, implementation, and self - evaluation. Two sources of information on case management in Wisconsin are listed. Appendices present a composite of 1 - page summaries of the separate county case management efforts, a more detailed description of the more developed county case management systems, and a compilation of the case management forms mentioned in the document.

SHR-0102001 PC **A04**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Economic Impact of Social Service Expenditures.
A. Harvey Block. Mar 81, 60p DHEW/PUB/OS-76/130, HUMAN SERVICES MONO SER-17

Intended to provide human services administrators with information to strengthen their position when requesting program funding, this monograph shows that human services programs have an important potential for economic impact beyond that offered by the direct dollars invested. Multiplicative effects of investments, which result from the relationship between sales and purchases in a local area, are examined by highlighting the Lowndes County Health Center Study (Alabama), the food stamp program, and the Community Development Corporation (CDC). The results of a study of the Lowndes County Health Center are presented as an example of the economic effects of health care funding. A study of the impact of the food stamp program on three county economies (in southwest Tennessee, southern Iowa, and eastern New Mexico) uses an input / output method in an attempt to ascertain the direct and indirect effects of the program in a manner similar to that used in the health center study. Both studies show the importance of understanding the effect on the surrounding area as well as on the locality. For example, the intent of the food stamp program is to ensure that people receive sufficient nutritious food. The secondary effects on the economy, however, could have a spiraling effect on the local economy's development and subsequently reduce the need for the Federal program. Also, the Community Development Corporation (CDC) program is described as created to enable the poor and minorities to combat the excesses of an economic system that bypasses them. The program's uniqueness lies in the recognition that community improvement can be attained only through a joint effort. Both economic and social activities are directed toward stimulating the local economy. The CDC program activities include building a sewage and water treatment plant in a local area and upgrading sanitation to improve residents' health status and attract new business. Demonstrating venture decision-making and how an input / output model can be applied as a planning tool, the CDC study shows that a venture that is highly labor intensive and appears to produce a large amount of labor income can have a smaller effect on the impact area economy than a venture whose initial payroll is considerably less. The inflationary impact of human service expenditures is also examined. It is suggested that cutting back on welfare payments and social expenditures would not be more effective at combating inflation than reducing any other kind of public or private expenditures. Charts, statistical data, and nine references are included. Discussions of the multipliers and the funding mechanism are appended.

SHR-0102501 PC **A05**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Refinancing and Reorganizing Human Services: Interagency Net Budgeting and Others Fiscal Incentives.
William C. Copeland, and Iver A. Iversen. Jun 81, 77p HUMAN SERVICES MONO SER-20

Written primarily for program managers, this monograph outlines the use of fiscal incentives to restructure program design and operation to cope with cutbacks in public funds for human service programs. Over the next 5 years, a shrinkage of one - half or more in available funds designated for social services can be expected. Nevertheless, Federal funds are available for increases in human services, provided that such services are organized into related systems of services and are planned and managed as such. In the next decade, the primary problem facing social services is that of making use of available funds by packaging total sets of services in order to minimize losses in actual services. Although current budgeting and programming practices produce disincentives to reform, reform can be advanced and eventually achieved through the combined use of two approaches, maximization of Federal funding and program restructuring, in which the program is constructed on systems - oriented lines as a continuum of care. Use of an interagency net budgeting approach, which requires systematic analysis of the interactions between budgets and of executive and legislative priorities, is outlined. The application of the system - of - care concept is presented by means of an example involving a continuum of care for the mentally retarded and developmentally disabled at the State level of organization. Basic techniques of maximization of Federal funding and the use of cost allocation as a maximization technique are then discussed. Implications of the Reagan administration's budget proposals are explored in a concluding section. Charts, tables, and nine references are provided.

SHR-0202801 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Networking Among Human Services Agencies.
Apr 81, 34p
Human Services Bibliography Series.

The 35 documents in this Project SHARE bibliography provide a representative sample of the literature on the coordination of services among human service agencies at the Federal, State, and local levels of administration. The bibliography includes reports, conference proceedings, and evaluations of ongoing programs, as well as discussions of potential strategies for developing a successful network. Other documents represent reports of unsuccessful networks and the evaluations of why they failed and how they could have been improved. Specific projects cited include Michigan's protection and advocacy network for the developmentally disabled, an interagency network in nine counties of central Missouri, Virginia's statewide network of health information and referral services, and a program to serve rape victims in Pasadena, Calif. Other projects include a youth service network in Minnesota, multistate efforts to plan for the elderly, and an online information and retrieval system in Michigan. Most of the documents were published between 1975 and 1979. For each document, bibliographic information, source, price and an abstract are provided.

SHR-0202901 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Human Services for Ethnic Minorities, Revised.
May 81, 40p
Human Services Bibliography Series. This is a supplement to the June 1978 bibliography entitled 'Human Services for Ethnic Minorities.'

This bibliography presents 50 documents with abstracts concerning a wide range of issues involved in serving minority populations. References were selected from the Project SHARE data base and were originally published during the 1970's. While some reports use data from several minorities to address a human service delivery problem, others focus on specific groups, including blacks, Hispanics, Italian and Polish subgroups, Asians, and American Indians. Documents review the minority presence in day care, community mental health, health care, child welfare, and care of the elderly. Also discussed are ethnic agencies, minority professionals in human services, discrimination against minorities by social service organizations, and cross cultural counseling. Programs instituted by schools of social work to sensitize human services professionals to the needs of minority clients are described. The abstracts are arranged in alphabetical order by author. Author and title indexes are provided.

SHR-0203001 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Human Services for Handicapped Persons.
Jun 81, 41p
Human Services Bibliography Series.

The 43 documents listed in this Project SHARE bibliography are representative of the literature concerning human services for physically and mentally handicapped persons. The documents examine innovative community services for handicapped children and adults, issues of special interest to human services planners, and methods of removing barriers to physically disabled individuals. Compliance with regulations regarding hiring handicapped workers and admitting qualified handicapped students to colleges and universities are also covered. In addition, community - based group homes for mentally handicapped adults receive attention, with emphasis on the issues of neighborhood attitudes, plans to combat zoning laws restricting the homes, efforts to gain community acceptance of handicapped residents, and cost comparisons of group homes with other types of community residential services. A 4 - year longitudinal study of mentally retarded adults as they adjusted to living in a community group home after being deinstitutionalized is also featured. The documents include books, journal articles, training manuals, and technical reports, most published between 1978 and 1981. For each document, bibliographic information, price, source, and an abstract are provided.

SHR-0203101 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Adoption and Foster Care for Special Needs Children.
May 81, 38p
Human Services Bibliography Series.

The 44 documents listed in this Project SHARE bibliography provide a representative sample of the literature on the adoption and foster care of older, handicapped, emotionally disturbed, neglected, and abused children. The issue of transracial adoption is also addressed. In addition, SHARE has included material that, while not specifically dealing with children with special needs, provides useful general information on adoption and foster care. Individual documents examine such subjects as the availability and success of programs of adoption and foster care of handicapped children, the use of group methods in the adoption process for children with special needs, arguments in favor of permanent foster placement for certain children, and guidelines for parents involved in foster family care. The documents include books, training manuals, journal articles, monographs, and procedure manuals, most published between 1975 and 1979. For each document, bibliographic information, price, source, and an abstract are provided.

SHR-0203201 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Effects of Neighborhood Consensus on Services Delivery.
Jul 81, 36p
Human Services Bibliography Series.

The 43 abstracts in this bibliography document efforts by citizens' groups throughout the United States to provide, or gain the ear of those providing, the services vital to the well - being of their neighborhoods. The references were selected from the Project SHARE data base and were originally published between 1970 and 1980, although most appeared during the decade's latter years. Citation data and ordering information accompany the abstracts which are arranged in alphabetical order by author. The topics covered in the bibliography range from a definition of a neighborhood to general suggestions on effective group structure and procedure. There are also descriptions of successful neighborhood projects concerned with medical and mental health services, prevention of juvenile delinquency, and services for families and the elderly. Other documents offer suggestions on community organizing and neighborhood development, as well as discussions of innovations such as skills banks and community resource centers to achieve neighborhood goals. An alphabetical list of personal or corporate authors and an index of titles are included.

SHR-0203301 PC **A04**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Accessibility of Human Services.
Oct 80, 52p
Human Services Bibliography Series.

The 66 documents listed in this Project SHARE bibliography examine the issue of access to social services with respect to the informational, administrative, attitudinal, cultural, and physical / geographic barriers that constrain both providers and consumers of services. The individual documents explore both specific barriers to access and the interaction of variables that produce these barriers. Recommendations are provided for reducing or removing barriers to access. Individual documents discuss such subjects as making buildings accessible to people with severe visual impairments, providing barrier - free environments for both physically and mentally handicapped persons, providing transportation for the elderly and rural residents, and methods of determining service accessibility. The bibliography includes approximately 66 books, journal articles, technical reports, and conference proceedings, most published between 1976 and 1979. For each document, bibliographic information, price, source, and an abstract are provided.

SHR-0203401 PC **A03**/MF **A01**
PROJECT SHARE (HHS), Rockville, MD.
Information Systems for the Human Services.
Jul 81, 41p
Human Services Bibliography Series.

The 48 documents listed in this Project SHARE bibliography provide a representative sample of the available literature on the use of computerized information systems in day care, education, public assistance, community and mental health, and local government settings. Effects of standardization on human services agencies and issues of privacy and confidentiality are two of the important questions related by these documents. Projects and pilot programs of varying success are presented, along with analyses of the benefits reaped and the problems encountered. In addition to computerized data systems, other forms of information dissemination -- "talkback radio," referral directories, and interactive cable television -- are discussed. The documents include books, journal articles, technical reports, and monographs, most published between 1976 and 1980. For each document, bibliographic information, price, source, and an abstract are provided.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A108 884/8 PC **A02**/MF **A01**
Baylor Coll. of Medicine, Houston, TX. Dept. of Physiology.
A Role for Cytoplasmic Structural Proteins in the Transport of Water and Salts in the Intestine.
Annual rept. 1 Feb 81-8 Dec 82,
Paula T. Beall. 8 Dec 81, 13p Rept no. TR-1
Contract N00014-81-K-0167

This contract supports research to test the hypothesis - that the movement of water and salts across the epithelial membrane of the intestine depends not only on the properties of the cellular membranes but also on the structural properties of the cytoplasm of the cells. Current theories ascribe all controls of cellular transport of water and salts to passive diffusion and specialized enzymes, pores, and channels at the cell membrane. Classical interpretation allows no role for the cytoplasmic components of the cells in regulation or control of transport. Scattered experimental evidence produced in the 1970's, however, suggests that the disruption of the microtubule and microfilament network of the cytoplasm can have an effect on the rate and direction of transport. This proposal is in the process of testing the idea that the cytoskeleton plays a role along with water to regulate transport. For this purpose the intestinal epithelium has been chosen as a membrane through which large amounts of sodium and water pass. This work is part of a coordinated effort among three labs to study this phenomenum in vivo in perfused rat intestine, in vitro on stripped intestinal mucosa in Ussing chambers, and in isolated intestinal enterocytes. Preliminary data produced by this team has already resulted in the acceptance of a role for cytoplasmic proteins in the electrical properties of the intestinal epithelium.

AD-A108 900/2 PC **A02**/MF **A01**
Naval Air Development Center, Warminster, PA. Aircraft and Crew Systems Technology Directorate.
Studies on the Mechanism of Action of the in vitro PGB(x) Effect. III. The Interaction between PGB(x) and Rat Liver Mitochondria.
Phase rept.,
Herman W. Shmukler, Sara F. Kwong, Margaret G. Zawryt, and Elaine F. Soffer. 17 Sep 81, 12p Rept no. NADC-81243-60
See also AD-A108 667.

Tritium labelled PGB sub x-active oligomers were synthesized by alkaline polymerization of (3)H-PGB sub 1. When added to PGB sub x assay system non-stoichiometric amount of (3)H-PGB sub 1x were bound to RLM. The degree of binding was dependent upon the concentration of (3)H-PGB sub 1x in the reaction. On the assumption that (3)H-PGB sub 1x and PGB sub x are similar or identical in structure, then no correlation between PGB sub x effect and PGB sub x binding by RLM could be found.

AD-A109 150/3 PC **A03**/MF **A01**
Maryland Univ., Baltimore. School of Medicine.
The Acetylcholine Receptor and Its Ionic Channel as Targets for Drugs and Toxins.
Final rept. 28 Sep 78-27 Sep 81,
Mohyee E. Eldefrawi, and Edson X. Albuquerque. 10 Dec 81, 30p ARO-15761.30-L
Grant DAAG29-78-G-0203

The overall objective of this study was to establish the pharmacology of the ionic channel of the peripheral nicotinic acetylcholine (ACh) receptor and to understand the mechanism by which this receptor controls the selective translocation of cations across membranes. The combination of electrophysiological techniques with biochemical ones helped us to understand the molecular properties of this ACh-receptor/channel and its interactions with drugs and toxins and also determine the cases where it may act as a secondary target for the action of a variety of drugs including anticholinesterases. Electrophysiological techniques were used to analyze the characteristics of endplate currents and channel properties of mammalian and frog skeletal muscles, while biochemical techniques were used to study the molecular characteristics and drug specificities of the ACh-receptor/channel of the electric organ of the electric ray, Torpedo sp. The data obtained suggest that the ACh-receptor/channel molecule carries two kinds of binding sites: receptor sites that bind ACh and alpha-bungarotoxin in a voltage-independent and almost temperature-independent manner, and channel sites that bind a variety of drugs in a voltage- and temperature-dependent manner, and are more sensitive than the receptor sites to treatment by the detergent Triton X-100 and sulfhydryl reducing and alkylating agents. The ACh-receptor/channel molecule undergoes different ligand/induced conformations, which we could detect by monitoring the apparent rates of binding of radiolabeled drugs to the channel sites.

AD-A109 231/1 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Nature of Regional and Chemically-Induced Differences in the Binding Properties of Muscarinic Acetylcholine Receptors from Rat Brain,
S. R. Ikeda, R. S. Aronstam, and M. E. Eldefrawi. 27 Dec 79, 12p ARO-15761.22-L
Grants DAAG29-78-G-0203, PHS-BNS76-21683
Availability: Pub. in Neuropharmacology, v19 p575-585 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 233/7 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
A New Mechanism Revealed for the Action of Antibodies on Acetylcholine Receptor Function,
A Desouki, A. T. Eldefrawi, and M. E. Eldefrawi. 6 Oct 80, 12p ARO-15761.26-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Availability: Pub. in Experimental Neurology, v73 p440-450 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 252/7 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Differentiation of the Open and Closed States of the Ionic Channels of Nicotinic Acetylcholine Receptors by Tricyclic Antidepressants,
G. G. Schofield, B. Witkop, J. E. Warnick, and E. X. Albuquerque. 30 Apr 81, 6p ARO-15761.25-L
Grant DAAG29-78-G-0203
Availability: Pub. in Proceedings of the National Academy of Sciences, v78 n8 p5240-5244 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 416/8 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Batrachotoxinin-A 20-alpha-Benzoate: A New Radioactive Ligand for Voltage Sensitive Sodium Channels,
George B. Brown, Stuart C. Tieszen, John W. Daly, Jordan E. Warnick, and Edson X. Albuquerque. 25 Jun 80, 23p ARO-15761.12-L
Grants DAAG29-78-G-0203, PHS-NS-15617
Pub. in Cellular and Molecular Neurobiology, v1 n1 p19-40 1981. Sponsored in part by Grant PHS-NS-12063.

No abstract available.

AD-A109 423/4 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Activation, Inactivation, and Desensitization of Acetylcholine Receptor Channel Complex Detected by Binding of Perhydrohistrionicotoxin,
Mohyee E. Eldefrawi, Robert S. Aronstam, Nabil M. Bakry, Amira T. Eldefrawi, and Edson X. Albuquerque. 16 Jan 80, 6p ARO-15761.16-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Sponsored in part by Grant PHS-NS-12063.
Availability: Pub. in Proceedings of the National Academy of Sciences, v77 n4 p2309-2313 Apr 80 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-153776 PC **A02**/MF **A01**
Texas A and M Univ., College Station. Dept. of Entomology.
Application of a Novel Radioimmunoassay to Identify Baculovirus Structural Proteins that Share Interspecies Antigenic Determinants.
Journal article,
Gale E. Smith, and Max D. Summers. 30 Mar 81, 15p EPA-600/J-81-518
Grant EPA-R-805232
Pub. in Jnl. of Virology, v39 n1 p125-137 Jul 81.

Viral proteins were electrophoresed in polyacrylamide gels, transferred to nitrocellulose, and incubated with viral antisera, and the antibodies were detected with 125 I-labeled Staphylococcus aureus protein A. Antisera were prepared to purified and intact virions from five baculoviruses: Autographa californica, Porthetria dispar, Trichoplusia ni, and Heliothis zea nuclear polyhedrosis viruses (NPVs) and T. ni granulosis virus (GV). These antisera were tested against the virion structural polypeptides of 17 different spcies of baculoviruses. Specific multiple-nucleocapsid NPV (MNPV), single-nucleocapsid NPV (SNPV), and GV virion polypeptides were shown to have similar antigenic determinants and thus be immunologically related. The molecular weights of the virion polypeptides with cross-reacting antigenic determinants were identified. Antisera prepared to purified A. californica and H. zea MNPV polyhedrin (the occlusion body protein from NPVs) recognized antigenic determinants on all the polyhedrins and granulins (occlusion body protein from GVs) that were tested. No immunological relationship was detected between A. californica MNPV polyhedrin and any of the A. californica MNPV virion structural polypeptides present on either the virus isolated from occlusion bodies or A. californica MNPV extracellular virus from infected-cell cultures.

PB82-154766 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
A Direct Method to Assay Neurotoxic Esterase Activity.
Journal article,
Salah A. Soliman, August Curley, and Abdel-Khalek El-Sebae. 23 Dec 80, 8p EPA-600/J-81-510
Contract EPA-68-02-3252
Pub. in Toxicology Letters 9, p283-288 1981.

A direct photometric method for assaying neurotoxic esterase (NTE) activity of chicken brain microsomal preparation has been developed using 4-nitrophenyl esters as substrates. Paired samples of the microsomal preparation were preincubated for 20 min. with paraoxon plus either (a) buffer or (b) mipafox before addition of substrate. The initial rate of NTE activity was directly recorded at 410 nm by matching the content of tube (a) against tube (b) after addition of the substrate to both of them. The 4-nitrophenyl esters of propionic, butyric, valeric, lauric, capric and caproic acids were tested as substrates. Results indicated that 4-nitrophenyl valerate and caporate, respectively, are the most hydrolyzable substrates for NTE with this method; it also enables detained kinetic studies of

NTE to be made. The Michaelis constant (Km) for the hydrolysis of 4-nitrophenyl valerate by NTE was found to be 0.0000555M.

PB82-861576 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ergot Alkaloids: Biosynthesis. 1979-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1979-Feb 82.
Feb 82, 84p

This bibliography contains citations concerning the biosynthesis of the ergot alkaloids. The environmental condition for the growth of fungi (particularly Claviceps species), and the isolation and separation of the alkaloids are considered. The hazards to humans and animals from consuming contaminated grains are briefly discussed. (Contains 79 citations fully indexed and includes a title list.)

PB82-930900 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Hormones in Cancer-Related Biology: Steroid Hormones.
Cancergram CB07.
1982, 12 issues
Supersedes PB81-930900.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The scope of this Cancergram is comprehensive coverage of steroid biochemistry, metabolism, and effects on tumors. Of primary interest are androgens, estrogens, progestagens, corticosteroids, and their respective metabolites and breakdown products. Synthetic steroids will also be noted when they are used nontherapeutically in cancer-related studies. Complementary to this series is Cancergram series CB24, covering the cancer-related biology of nonsteroid hormones. Studies specifically concerning steroid hormone-related carcinogenesis are generally excluded here, as they are covered by Cancergram series CK05.

PB82-931400 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Molecular Biology: Cyclic Nucleotides.
Cancergram CB14.
1982, 12 issues
Supersedes PB81-931400.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram concerns the role of cyclic nucleotides and their derivatives in a wide variety of cellular processes in neoplastic cells and tissues, and related studies in normal cell systems which contribute to an understanding of cyclic nucleotide metabolism and role in neoplasia. Specific areas of emphasis are the effects of cyclic nucleotides on regulations of growth and differentiation, and on membrane properties of normal and neoplastic cells. Regulation of cyclic nucleotide levels and metabolism, and studies of cyclic nucleotide-dependent protein kinase activity in cancer cells and tissues, are also within scope.

PB82-932400 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Hormones in Cancer-Related Biology: Non-Steroid Hormones.
Cancergram CB24.
1982, 12 issues
Supersedes PB81-932400.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram covers all nonsteroid hormones, including circulating protein and protein-derived hormones, and hypothalamic peptide inhibitory and releasing factors. Other hormones of interest are placental hormones and specific organ effectors, such as the secretingastrin system, vasoactive peptides, biogenic amines, and the poietins. Studies concerning synthesis, maturation, and binding of nonsteroid hormones are included. Emphasis is on effects of these hormones on basic cell metabolism and growth, and the relationship of these substances to the development and progression of tumors. Studies dealing directly with carcinogenic effects of hormones are largely excluded, however, as this subject is comprehensively covered by Cancergram CK05. Interrelationships with steroids are in scope; however, most studies concerning the cancer biology of steroid hormones are covered in Cancergram CB207.

6C. Biology

AD-A108 873/1 PC **A02**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Microbiology.
Diffusion of Water Soluble Spin Labels in the Aqueous Phase of Mammalian Cells.
Final rept. 1 Apr 79-30 Jun 81,
Andrea M. Mastro, and Alec D. Keith. 15 Dec 81, 5p
Rept no. 7A-720
Contract N00014-79-C-0253

A technique using small water soluble spin labeled molecules was developed to measure diffusion and viscosity in mammalian cell cytoplasm. The noncytotoxic molecules freely entered the cells. The signal of extracellular material was quenched with a broadening agent, NiCl2. The movement of the intracellular molecules, both rotational and translational, is determined by the cell cytoplasm microenvironment. This microenvironment consists of many diffusion barriers such as organelles, microfilaments and microtubules. The movements of spin labels in model systems such as solutions of various viscosities or matrices of defined small spaces, were used to interpret the movement of these same molecules in cells. Both growing and quiescent 3T3 fibroblasts and their SV40 virus transformed counterparts were tested as were cells treated with drugs which can change the cell microenvironment. Changes in growth state and cytoplasmic environment caused either a more free or a more restricted state in the cytoplasm as detected by the motion of the spin label molecules. (Author)

N82-14995/6 PC **A03**/MF **A01**
University Coll., Cardiff (Wales).
Interstellar Grains Investigated and Comets Proposed as a Vehicle for Panspermia.
F. Hoyle, and N. C. Wickramasinghe. Nov 80, 49p
PREPRINT-65
Submitted for Publication.

No abstract available.

PB82-146283 PC **A03**/MF **A01**
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
Model Great Lakes Commercial Fisheries Statute Adapted for Use in the State of Michigan,
Daniel A. Bronstein, Daniel R. Talhelm, Lynn K. Richardson, Heidi Grether, and Michael R. Thomas.
Aug 81, 50p MICHU-SG-81-200, NOAA-81100902
Grant NA79AA-D-00093

The text of a model Act, including explanatory comments, which incorporates the current thinking of fishery biologists and economists regarding proper management of commercial fisheries is proposed. Among the principal concepts used are optimum (equitable) yield over time, fish stock assessment and quota share allocation. Written so as to conform to Michigan constitutional, legal and administrative constraints, the Act would be suitable for adoption in other states.

PB82-148271 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
Progress in Controlled Environment Aquaculture and Algae Husbandry,
Norman Doelling. 1 Jul 81, 32p MITSG-81-5, OPPORTUNITY BRIEF-24, NOAA-81102110
Index No. 81-605-Ylr.

This Brief summarizes two food-related topics being investigated at the University of Delaware: closed cycle aquaculture systems for growing oysters, and the potential for domesticating plants which grow in brackish water for commercial sources of fodder, grain or seed crops. In both areas results indicate that industrial involvement could be timely and profitable. While the goal of economically raising oysters to full, marketable maturity remains unmet, the system may have significant value in growing seed oysters to sizes of up to about 1 cm.

PB82-148321 PC **A06**/MF **A01**
Texas A and M Univ., College Station. Dept. of Wildlife and Fisheries Sciences.
Aquaculture in Texas: A Status Report and Development Plan,
Robert R. Stickney, and James T. Davis. Aug 81, 116p TAMU-SG-81-119, NOAA-81102105

The report is referred to as the Texas Aquaculture Plan. The plan sets forth goals which appear to be realistic at the time of conception. New goals will be developed and old ones modified, deleted or achieved as time passes following implementation of the plan. The present document provides background information on the potential for Texas aquaculture, outlines some of the constrants and advantages the state holds for aquaculturists, and presents the needs which should be addressed by researchers, legislators, lending institutions and other groups.

PB82-148693 PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
All-Nation Removals of Groundfish, Herring, and Shrimp from the Eastern Bering Sea and Northeast Pacific Ocean, 1964-80.
Technical memo.,
Sueto Murai, Harold A. Gangmark, and Robert R. French. Sep 81, 46p NOAA-TM-NMFS-F/NWC-14, NOAA-81103010

The purpose of this statistical compilation is to provide in a single document a summary of the best estimate of catches for the years 1964-80, by species and convenient statistical areas, of all available catch data. In addition, data from joint ventures between U.S. fishermen and processing vessels of South Korea, Poland, and the USSR are compiled in tables. The sources of the 1977-78 data are the annual submission by foreign nations permitted to fish in the U.S. fishery conservation zone and from records provided by Canada and the various states which report U.S. catch statistics.

PB82-148701 PC **A02**/MF **A01**
National Marine Fisheries Service, Miami, FL. Southeast Fisheries Center.
Sea Surface Areas by Fishing Zones Off the Coast of Northeastern South America.
Technical memo.,
Joseph E. Tashiro. Sep 81, 15p NOAA-TM-NMFS-SEFC-81, NOAA-81103003

The waters off northeastern South America support the large Guianas-Brazil shrimp fishery. Thirteen fishing zones were established for these waters by shrimping interests to identify the general location of shrimp catches and production. In this paper, the 13 fishing zones are subdivided into 65 depth zones, their areas calculated from nautical charts, and presented in tabular form.

PB82-150400 PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Factors Affecting Bottom Trawl Behavior: Results of Experiments with 83/112 Eastern Trawls Towed from the NOAA Ship MILLER FREEMAN,
Charles William West. Sep 81, 43p NOAA-TM-NMFS-F/NWC-16, NOAA-81103012

Catch results from bottom trawl surveys are used to estimate the abundance of demersal fishery resources in the northeast Pacific Ocean and the Bering Sea. The magnitude and composition of bottom trawl catches is influenced among other factors by the physical performance of the trawl. This paper describes the results of these observations and identifies some of the physical factors of the towing situation that were found to affect trawl performance.

PB82-150756 PC **A06**/MF **A01**
Bhargava (Indra), New Delhi (India).
Histology - A Systems Approach,
Indra Bhargava. c1981, 121p
Available in India only through Constellate Consultants (P), Ltd.

In this book a systems approach has been applied to the design of instruction in histology and microanatomy, with emphasis on microanatomical organization and related principles of learning. The presentation has utilized flow charts for the factual aspects of the organization and algorithms, as a logical procedure for discriminatory activity, essential for identification of microanatomical units and organs. These procedures

have the advantage of accuracy and brevity by encapsulating the essential information on a single chart. The final choice of teaching method, teaching materials, and illustrations is to be made by the department concerned and its faculty. Conventional line diagrams and photomicrographs have been deleted from this book. The utility of the graphics in this system can be augmented by coloring various components of a flow chart in a differential manner. For this purpose a color scheme can be devised in which similar components of different structural units are colored with the same color. This technique encourages greater student participation in the learning process. The books chapter headings are: Use of a microscope; the cell and its structure; tissues and their elements; structural units in microanatomy; principles of microanatomical organization; discriminatory activity for structural units; structural plan of organs (44 flow charts of different organs); and identification of organs (16 flow charts of different organs). Available in India only through Constellate Consultants (P), Ltd.

PB82-151960 PC **A10**/MF **A01**
National Marine Fisheries Service, Washington, DC.
Virginia Landings, January 1977 - December 1979.
Current Fisheries statistics.
1979, 208p CFS-7237-VA, NOAA-81110502
See also report dated Jan 78, PB-300 637.

The monthly publication, Current Fisheries Statistics for Virginia Landings has been compiled for January 1977 through December 1979. The Annual Summary issues for 1977, 1978, and 1979 are included. Data includes commercial landings of fish and shellfish in pounds and dollar value in the Atlantic Ocean, Chesapeake Bay and Chesapeake Bay Tributaries including all tributaries except the Potomac River.

PB82-151978 PC **A07**/MF **A01**
National Marine Fisheries Service, Washington, DC.
North Carolina Landings, January 1977 - December 1979.
Current Fisheries statistics.
1979, 134p CFS-7238-NC, NOAA-81110501
See also PB-288 928.

The monthly publication, Current Fisheries Statistics for North Carolina Landings has been compiled for January 1977 through December 1979. The Annual Summary issues for 1977, 1978, and 1979 are included. Data includes commercial landings by species in pounds and dollar value at districts in North Carolina.

PB82-153875 PC **A04**/MF **A01**
Woods Hole Oceanographic Institution, MA.
Bibliography of Socio-Economic Studies: Fisheries of the Northeast U.S.
Technical rept.,
Rosamund Ladner, Leah J. Smith, Susan Peterson, and James Wilson. Nov 81, 56p WHOI-81-99, NOAA-81111606
Grants NA81FA-C-00018, NA80AA-D-0077
Prepared in cooperation with Maine Univ. at Orono. Dept. of Economics.

This bibliography of social and economic studies of the fisheries of the Northeast United States (Maine to North Carolina) includes annotated listings for each entry and an index of key words for cross-refrencing. The authors have attempted to include all studies published since 1970, and a selected group of particularly significant studies done earlier. The major focus has been on commercial fisheries, but recreational fishing studies have also been included. Studies of Canadian fishing subsidies, European and other markets, have been included because of their relevance to the regional industry.

PB82-155292 PC **A03**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Viral Diseases of Invertebrates Other Than Insects,
John A. Couch. Dec 81, 34p EPA-600/D-80-055
Pub. in Pathogenesis of Invertebrate Microbial Diseases (Allanheld, Osmun and Co., Totowa, NJ.), p127-160.

Thirteen examples of virus or viruslike related pathoses in non-insect invertebrates are described. From consideration of these examples, it becomes obvious that detailed descriptions of pathogenesis of virus diseases in non-insect invertebrates has not kept pace with the frequency of new reports of viruses from these invertebrates. When possible, it is of utmost importance for authors reporting viral entities from invertebrates to include as much information as can be collected on the disease syndrome, cellular pathogenesis, physiological and behavioral effects and tissue distribution of the virus. In some cases, information has been so scant that readers are not even certain as to the prevalence of the virus in reported hosts. Basic information on the nature of non-insect invertebrate virus diseases is needed for several reasons. Insights into mechanisms of pathogenesis and pathogenic effects in invertebrate viruses may give better understanding of vertebrate virus diseases. Further, a major opportunity exists with invertebrate virus disease to investigate the fundamental aspects of cellular immunity.

PB82-156183 PC **A07**/MF **A01**
National Marine Fisheries Service, Washington, DC.
Shrimp Landings, January 1977-December 1978.
Current fisheries statistics.
1978, 135p IA-)CFS-7246, NOAA-81111601
See also report dated Dec 78, PB80-124696.

The report, Current Fisheries Statistics for Shrimp Landings has been compiled for January 1977 through December 1978. The Annual Summary issues for 1977 and 1978 are included. Data includes commercial shrimp landings by type and region, specified periods, 1976 and 1977, and 1977 and 1978. The data are given in heads-off weight (pounds) and in dollar value.

PB82-156258 PC **A09**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Fishery Bulletin. Volume 79, Number 3, July 1981.
Jul 81, 191p NOAA-81111603
See also PB82-156266 thru PB82-156415 and Volume 79, Number 1, PB82-102153.

The titles of some of the articles in this issue are: The osteology and relationships of the angler fish genus Tetrabrachium with comments on lophiiform classification; Early zoeal stages of Lebbeus polaris, Eualus suckleyi, E. fabricii, Spirontocaris arcuata, S. ochotensis, and Heptacarpus camtschaticus and morphological characterization of zoeae of Spirontocaris and related genera; Feeding behavior and biology of young sandbar sharks, Carcharhinus plumbeus in Chincoteague Bay, Virginia; Seasonal changes in soft-body component indices and energy reserves in the Atlantic deep-sea scallop, Placopecten magellanicus; Effects of photoperiod and feeding on daily growth patterns in otoliths of juvenile Tilapia nilotica; Prey of the Steller sea lion, Eumetopias jubatus, in the Gulf of Alaska; Offshore distribution of alewife, Alosa pseudoharengus, and blueback herring, Alosa aestivalis, along the Atlantic coast; The complete larval development in the laboratory of Micropanope sculptipes with a comparison of larval characters in western Atlantic xanthid genera; and others.

PB82-156340
(Order as PB82-156258, PC **A09**/MF **A01**)
National Marine Fisheries Service, Portland, OR. Environmental and Technical Services Div.
Establishment of Nonindigenous Runs of Spring Chinook Salmon, 'Oncorhynchus tshawytscha', in the Wind River Drainage of the Columbia River, 1955-63,
Roy J. Wahle, and Ed Chaney. Apr 81, 11p NOAA-81111603-9
Prepared in cooperation with Northwest Resource Information Center, Inc., Eagle, ID.
Included in Fishery Bulletin, v79 n3 p507-516 1981.

In 1955, cooperating agencies of the Columbia River Fishery Development Program embarked upon a 9-year program to introduce nonindigenous spring chinook salmon, Oncorhynchus tshawytscha, into Wind River, a tributary of the Columbia River. The program which consisted of: (1) construction of a fishway at an impassable falls on the lower Wind River, (2) transplantation of nonindigenous adult spring chinook salmon from the Columbia River to Carson National Fish Hatchery on the upper Wind River, and (3) rearing and release of juvenile spring chinook salmon into the Wind River.

PB82-156357
(Order as PB82-156258, PC **A09**/MF **A01**)
Department of Primary Industry, Konedobu (Papua New Guinea). Kanudi Fisheries Research Lab.
Estimated Growth of Surface-Schooling Skipjack Tuna, 'Katsuwonus pelamis' and Yellowfin Tuna, 'Thunnus albacares', from the Papua New Guinea Region,
J. W. J. Wankowski. Feb 81, 17p NOAA-81111603-10
Included in Fishery Bulletin, v79 n3 p517-532 1981.

The study was undertaken on length-frequency data collected from the Papua New Guinea pole-and-line fishery between June 1977 and December 1979. Both skipjack and yellowfin tunas are recruited to all areas of the fishery at between 30 and 46 cm fork length. Skipjack tuna remain in the exploited phase up to an average 69 cm fork length and yellowfin tuna up to an average 85 cm fork length. Periods of time during which the greatest range of fork length occurred in the catch correspond with periods of low abundance, as inferred from catch per unit of effort indices.

PB82-156407
(Order as PB82-156258, PC **A09**/MF **A01**)
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Growth Characteristics of Young-of-the-Walleye, 'Stizostedion vitreum vitreum', in John Day Reservoir on the Columbia River, 1979,
Dean A. Brege. Jul 81, 4p NOAA-81111603-15
Included in Fishery Bulletin, v79 n3 p567-569 1981.

The increase in walleye Stizostedion vitreum, population in many of the large reservoirs of the Columbia River has generated considerable interest among sport fishermen throughout the area. Information yielded by monitoring the young-of-the-year walleye in John Day Reservoir is presented in this paper. A comparison between growth of walleye in this reservoir and walleye populations from other areas is also given.

PB82-157447
(Order as PB82-157439, PC **A10**/MF **A01**)
New Hampshire Univ., Durham.
The Biology, Fisheries, and Management of the Queen Conch, 'Strombus gigas',
Willard N. Brownell, and John M. Stevely. Jul 81, 13p NOAA-81102302-1
Prepared in cooperation with Florida Univ., Palmeto. Marine Advisory Program.
Included in Marine Fisheries Review, v43 n7 p1-12 Jul 81.

Available information on the biology, fisheries, and culture of the queen conch, Strombus gigas, throughout its geographic range, is reviewed in the report. Beginning in the early 1970's, development of a lucrative frozen conch meat market in the United States dramatically increased the economic significance of the queen conch. However, the current condition of several conch fisheries indicates that these stocks are insufficient to meet demand.

PB82-157454
(Order as PB82-157439, PC **A10**/MF **A01**)
National Marine Fisheries Service, Auke Bay, AK. Auke Bay Lab.
Habitat and Nursery Grounds of Pacific Rockfish, 'Sebastes' spp., in Rocky Coastal Areas of Southeastern Alaska,
H. Richard Carlson, and Richard R. Straty. Jul 81, 8p NOAA-81120302-2
Included in Marine Fisheries Review, v43 n7 p13-19 Jul 81.

During late July 1978 a small submarine was used to explore the rugged rocky substrate along the coast of southeastern Alaska to depths of nearly 240 m (130 fathoms). The extensive boulder fields and pinnacle-studded bottom were populated mostly by rockfish, Sebastes, which held several species and a wide range of sizes. This untrawlable zone is a nursery area for rockfish, and dense schools of thousands of small 6-8 cm (2.5-3 inch) red rockfish were sighted at 90-100m (49-55 fathom) depths over crevices and cover.

PB82-157462
(Order as PB82-157439, PC **A10**/MF **A01**)
Gulf of Mexico Fishery Management Council, Tampa, FL.
Conditional Fishery Status as a Solution to Overcapitalization in the Gulf of Mexico Shrimp Fishery,
Vito Blomo. Jul 81, 6p NOAA-81120302-3
Included in Marine Fisheries Review, v43 n7 p20-24 Jul 81.

The Gulf shrimp fishery exhibits the classic symptoms of overcapitalization in an open access fishery enjoying high product prices. Analysis of the growth in vessel numbers and effort, the low rate of capacity utilization in engineering and economic terms, and the volatility of profits for what is essentially a luxury item appear to be adequate justification for conditional fishery status. Immediate effects of such status are denial of new applications for federal loan guarantee and income tax deferral programs.

PB82-157645 PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Marine Fisheries Review. Volume 43, Number 8, August 1981.
Aug 81, 40p NOAA-81120303
See also PB82-157652 thru PB82-157678, Volume 43, Number 6, PB82-153412 and Volume 43, Number 4, PB82-126756.

In addition to its regular features, this issue contains the following articles: A Biological and Economic Analysis of the North Carolina Charter Boat Fishery; Paying-Passenger Recreational Fisheries of the Florida Gulf and Keys; and Possible Temperature Effects on Charter Boat Catches of King Mackerel and Other Coastal Pelagic Species in Northwest Florida.

PB82-157652
(Order as PB82-157645, PC **A03**/MF **A01**)
National Marine Fisheries Service, Beaufort, NC. Beaufort Lab.
A Biological and Economic Analysis of the North Carolina Charter Boat Fishery,
Charles S. Manooch, III, Leon E. Abbas, and Jeffrey L. Ross. Aug 81, 12p CONTRIB-81-07-B, NOAA-81120303-1
Included in Marine Fisheries Review, v43 n8 p1-11 Aug 81.

North Carolina's 135 charter boats were surveyed during the 1978 fishing season, April through November, to gather information on catch and effort and profitability of the fishery. The fleet made 9,812 trips during the year: 8,449 trips trolling for pelagic fish, 1,188 bottom fishing for reef fish, 118 bottom fishing in estuaries, and 57 trips carrying scuba divers. A total of 1,849,726 pounds of fish representing 36 species were caught. Major species landed while trolling were king mackerel, bluefish, and dolphin.

PB82-157660
(Order as PB82-157645, PC **A03**/MF **A01**)
National Marine Fisheries Service, Miami, FL. Southeast Fisheries Center.
Paying-Passenger Recreational Fisheries of the Florida Gulf Coast and Keys,
Joan A. Browder, J. Connor Davis, and Eulalie Sullivan. Aug 81, 10p NOAA-81120303-2
Included in Marine Fisheries Review, v43 n8 p12-20 Aug 81.

Four types of paying-passenger recreational fisheries operate on the Florida Gulf coast and in the Florida Keys: Offshore charter boat, inshore-offshore charter boat, guide boat, and head boat. An estimated 604 captains were active in the fisheries in 1977. Target species differ with fishery type and region of operation. Declining catches and increased operating costs, particularly for fuel, are major problems of these fisheries, according to the captains.

PB82-157678
(Order as PB82-157645, PC **A03**/MF **A01**)
National Marine Fisheries Service, Panama City, FL. Panama City Lab.
Possible Temperature Effects on Charter Boart Catches of King Mackerel and Other Coastal Pelagic Species in Northwest Florida,
William A. Fable, Jr., Harold A. Brusher, Lee Trent, and Joe Finnegan, Jr. Aug 81, 7p CONTRIB-81-19-PC, NOAA-81120303-3
Included in Marine Fisheries Review, v43 n8 p21-26 Aug 81.

Dramatic changes occurred in the landings, species composition, and sizes of fishes caught in the charter boat fishery for pelagic fishes in northwest Florida in the summers of 1977 and 1978. These changes occurred after two of the coldest winters in 100 years. Catch per hour (CPH) of king mackerel, the target species, declined greatly, while CPH of Atlantic bonita and bluefish increased. Data indicated that warm winters resulted in high CPH, while cool winters resulted in low CPH.

PB82-157686 PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Marine Fisheries Review. Volume 43, Number 9, September 1981.
Sep 81, 40p NOAA-81120304
See also PB82-157694 thru PB82-157710 and Volume 43, Number 8, PB82-157645.

In addition to its regular features, this issue contains the following articles: Anchored fish aggregating devices in Hawaiian waters; The performance and environmental effects of a hydraulic clam dredge; and A comparison of rearing costs and returns of selected herbivorous, omnivorous and carnivorous aquatic species.

PB82-157694
(Order as PB82-157686, PC **A03**/MF **A01**)
National Marine Fisheries Service, Honolulu, HI. Southwest Fisheries Center.
Anchored Fish Aggregating Devices in Hawaiian Waters,
Water M. Matsumoto, Thomas K. Kazama, and Donald C. Aasted. Sep 81, 14p NOAA-81120304-1
Included in Marine Fisheries Review, v43 n9 p1-13 Sep 81.

Fish aggregating devices (FAD's) made of 55-gallon oil drums and wooden rafts were moored in Hawaiian waters off the islands of Oahu, Lanai, and Hawaii from May 1977 through July 1979. The FAD's successfully attracted numerous pelagic fishes, including large schools of skipjack and small yellowfin tunas.

PB82-157702
(Order as PB82-157686, PC **A03**/MF **A01**)
National Marine Fisheries Service, Woods Hole, MA. Northeast Fisheries Center.
The Performance and Environmental Effects of a Hydraulic Clam Dredge,
Thomas L. Meyer, Richard A. Cooper, and Kenneth J. Pecci. Sep 81, 10p NOAA-81120304-2
Included in Marine Fisheries Review, v43 n9 p14-22 Sep 81.

The efficiency of a 1.2 m hydraulic clam dredge in a surf clam, Spisula solidissima population was demonstrated by diver scientists to be sensitive to factors such as: Speed of towing, scope of tow line and water hose, and distance between cutting blade and water manifold. When these operational specifications were near optimum, the dredge removed 91% of the available clams; when below optimum, efficiency was 80%. When dredge performance was low; larger clams, which burrowed deeper into the sediment, suffered mortalities as high as 92%; when high, mortalities decreased to 30%.

PB82-157710
(Order as PB82-157686, PC **A03**/MF **A01**)
Hawaii Univ., Honolulu.
A Comparison of Rearing Costs and Returns of Selected Herbivorous, Omnivorous, and Carnivorous Aquatic Species,
Yung C. Shang. Sep 81, 3p NOAA-81120304-3
Included in Marine Fisheries Review, v43 n9 p23-24 Sep 81.

The extent to which protein from selected aquatic herbivorous species is less costly to produce than from aquatic carnivorous and omnivorous species is examined. The question of whether the culture of high market value species leads to a higher rate of return is also examined. The quality of protein is equal between carnivores and herbivores, and the preference for one over the other is very much culture conditioned and economic oriented.

PB82-158130 PC **A02**/MF **A01**
National Heart, Lung, and Blood Inst., Bethesda, MD.
Effects of Environmental Conditions on Isoprene Emission from Live Oak.
Journal article,
David T. Tingey, Rosemary Evans, and Marcia Gumpertz. 27 May 81, 8p EPA-600/J-82-493
Pub. in Planta 152, p565-570 1981. Prepared in cooperation with Northrop Services, Inc., Corvallis, OR.

Live-oak plants (Quercus virginia) were subjected to various levels of CO2, water stress or photosynthetic photon flux density to test the hypothesis that isoprene biosynthesis occurred only under conditions of restricted CO2 availability. Isoprene emission increases as the ambient CO2 concentration decreased, independent of the amount of time that plants had photosynthesized at ambient CO2 levels. When plants are water-stressed over a 4-d period photosynthesis and leaf conductance decreased 98 and 94%, respectively, while isoprene emissions remained constant. These data indicate that isoprene is a normal plant metabolite.

PB82-158171 PC **A02**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Aspects of the Host - Commensal Relationship between a Palaemonid Shrimp ('Pontonia domestica') and the Pen Shell ('Atrina rigida').
Journal article,
Lee A. Courtney, and John A. Couch. 1981, 8p EPA-600/J-81-041, ERL.GB-J115
Pub. in Northeast Gulf Science, v5 n1 p49-54 Oct 81.

Sixty pen shells (Atrina rigida), were collected and examined to determine the prevalence and morphometrics of the commensal shrimp (Pontonia domestica). The spatial and sexual distribution within the shell of the host, and the reproductive states of the shrimp were also investigated.

PB82-158221 PC **A02**/MF **A01**
Institute of Paper Chemistry, Appleton, WI.
Notes on Mayfly Nymphs from Northeastern Minnesota Which Key to 'Stenonema vicarium' (Ephemeroptera: Heptageniidae).
Journal article,
Thomas M. Lager, and Philip A. Lewis. 1978, 1p EPA-600/J-78-191
Pub. in Great Lakes Entomologist, v11 p261 1978.

Stenonema mayfly nymphs which key to Stenonema vicarium from Northeastern Minnesota should be considered to be Stenonema fuscum based on specimens that have been reared to adults.

PB82-158247 PC **A02**/MF **A01**
Environmental Monitoring and Support Lab.-Cincinnati, OH.
An Elementary Mathematical Problem Arising in Diatom Taxonomy.
Journal article,
Gary B. Collins, and C. W. Groetsch. 1981, 5p EPA-600/J-81-489
Pub. in Int. Jnl. Math. Educ. Sci. Technol., v12 n1 p121-124 1981. Prepared in cooperation with Cincinnati Univ., OH. Dept. of Mathematical Sciences.

This paper involves a problem confronted by the working diatom taxonomist who must make some basic observations and measurements of the diatom cell wall to achieve an accurate identification. the identification of diatoms to the species level is possible by microscopic observation and measurement of the intricate patterns on the cell wall. Since diatoms form the beginning of many aquatic food chains, they are important in many environmental studies and diatom communities can be used to assess the integrity or health of aquatic ecosystems. A morphological feature used in identification of centric diatoms is the number of striae found in a 10 micron arc along the edge of the diatom. This measurement is made by using a reticule in the microscope eyepiece. For large cells the arc and the 10 micron measuring cord become essentially identical. But for small cells the arc becomes increasingly larger than the 10 micron measuring cord, resulting in a distortion of the measured striae density. The solution of the problem of determining at what cell size a different method of determining the striae density must be used is presented.

PB82-930400 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Structural and Functional Aspects of Cell Membranes.
Cancergram CB06.
1982, 12 issues
Supersedes PB81-930400.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram includes studies that elucidate membrane structure, function and composition of normal and transformed cells. Abstracts include concerned investigations on biophysical and biochemical properties, adhesion and cell interaction, transport processes, receptor analysis and membrane probes. In general, abstracts describing tumor and other cell surface antigens (covered by Cancergram CB05) are ex-

cluded, unless information on the biochemical composition of these antigens is related to membrane structure.

PB82-931900 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Cytology: Techniques, Applications.
Cancergram CB21.
1982, 12 issues
Supersedes PB81-931900.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram focuses on the cytological techniques and methodologies employed in general experimental studies related to cancer research. The cytological technologies involved in preclinical, diagnostic, and therapeutic studies are also included. Specific areas of interest are microscopic and autoradiographic techniques, flow systems analysis, histochemistry and cytochemistry, and methodologies related to cytological instrumentation.

PB82-932100 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Cell Biology: Growth Regulation, Differentiation.
Cancergram CB16.
1982, 12 issues
Supersedes PB81-932100.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The scope of this Cancergram includes factors which have significant effects on growth and differentiation of normal and neoplastic cells in vivo and in vitro. The scope centers on the production, physical characteristics, and action of these growth regulatory factors in human and animal model systems. Emphasis is placed on factors which are endogenously produced, including chalones, prostaglandins, polyamines, and other serum and cellular factors; however, certain exogenous agents (such as nutritional factors, tumor promotors, and certain viruses) which have a principal effect on cell growth and differentiation are selectively covered. Of peripheral interest are studies involving agents that directly affect the production or function of growth factors. Papers on steroid hormones and cyclic nucleotides are included only if they relate to regulation of growth or differentiation. Other papers pertaining to the biology of steroid hormones and cyclic nucleotides appear in Cancergrams CB07 and CB14, respectively. The characterization and measurement of cell growth and cell replication are not within the scope of this Cancergram; these topics are covered by Cancergram CB09.

PB82-932500 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Molecular Biology: DNA.
Cancergram CB25.
1982, 12 issues
Supersedes PB81-932500.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram covers most aspects of DNA metabolism in normal and neoplastic cells. Emphasis is on mechanisms of DNA replication and repair, and on DNA structure, sequence, and modification. Studies of chromatin and nucleosome structure and modification are included; however, studies emphasizing the associated nuclear proteins are covered in Cancergram CB27, and cytogenetic studies are the topic of Cancergram CB12. As the primary focus of this Cancergram is on cellular processes, inclusion of studies of viral DNA metabolism is limited to those which may elucidate basic aspects of cellular DNA metabolism. DNA viruses and viral replication are comprehensively covered by Cancergrams CB04 and CB11. Coverage of DNA repair focuses on mechanisms of repair rather than the induction of damage by chemicals or radiation, topics already covered by Cancergrams CK11 and CK06. DNA as template for RNA transcription is also excluded, as transcription is specifically covered in Cancergram CB26.

PB82-932600 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Molecular Biology: RNA.
Cancergram CB26.
1982, 12 issues
Supersedes PB81-932600.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram covers the isolation, characterization, synthesis, modification, and degradation of RNA in normal and cancer cells. Characterization and measurement of cellular levels of heterogeneous nuclear RNA, messenger RNA, ribosomal RNA, and transfer RNA are of central interest. Studies of the mechanism and control enzymes involved in RNA metabolism are also included. The cellular process of translation is covered in Cancergram CB27. As the primary focus of this Cancergram is on cellular RNA, studies on viral nucleic acids are included only when they may illuminate aspects of cellular RNA metabolism. This and other cancer-related aspects of the RNA viruses are comprehensively covered in Cancergrams CB22 (Cell Biology and Animal Studies) and CB23 (Molecular Biology).

PB82-932700 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Molecular Biology: Proteins, Polypeptides, Amino Acids.
Cancergram CB27.
1982, 12 issues
Supersedes PB81-932700.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram concerns cancer-related biochemical and physicochemical studies of the synthesis, metabolism, structure, and characterization of proteins. This includes absorption and transport of amino acids; the intracellular events in RNA; protein translation; the final assembly of polypeptides and proteins; and the biological transformation, degradation, and excretion of proteins and protein end products. The Cancergram covers structural and functional characterization of major classes of cellular proteins, such as histones and other nuclear proteins, the microsomal system, cytoskeletal and mitotic proteins, and both surface and intracellular membrane proteins. Emphasis is placed on observable differences in these protein properties between normal and tumor cells. Studies of extracellular proteins, plasma proteins, and tumor products are generally excluded, except where they provide insight into the basic processes of protein metabolism. Polyamines are covered in a special category within this Cancergram. Additional coverage of specific proteins of current research interest is provided in the following Cancergrams: CB01, Oncofetal Proteins; CB24, Hormones in Cancer-related Biology-non-steroid hormones; CB06, Structural and Functional Aspects of Cell Membranes; CB16, Cell Biology-growth Regulation, Differentiation; CB08, Immunobiology and Cancer-Antibodies and Humoral Immunity; and CB05, Immunobiology and Cancer-Tumor-Associated Antigens.

6E. Clinical Medicine

AD-A108 791/5 PC **A21**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Walter Reed Army Institute of Research Annual Progress Report, Fiscal Year 1980.
Rept. for 1 Oct 79-30 Sep 80,
Philip K. Russell. 1 Oct 80, 462p

The various subjects covered in this report are listed in the Table of Contents. Abstracts of the individual investigators are included on the DD Form 1498 introducing each work unit report. (Author)

AD-A108 837/6 PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
Predicting the Effectiveness of Concepts for Future Marine Corps Medical Support Systems. Preliminary Report.
Memorandum rept.,
J. R. Fletcher, and P. B. Richards. 10 Dec 81, 54p
Rept no. NRL-MR-4711

This is a preliminary attempt to identify options for overcoming delays in providing emergency, life-saving medical care in a mass casualty situation. Faced with the need to predict the effects of possible shortages of key medical personnel, particularly surgeons, and also faced with the possibility that medevac helicopters might be inoperable in combat, the Marine Corps requested the authors to analyze in detail Navy/Marine Corps plans for supporting Marine Corps combat operations in the 1984-1993 time period. The principal tool is used in this study was the Navy's WWMMSS (World-Wide Military Medical Support System) simulation model. Projected patient loads were approximately 1400 casualties on D-Day, followed by a steady constant influx of about 400 casualties per day, in a conventional warfare environment. The WWMMSS model predicted that with currently planned medical personnel and procedures, more than 8% of all patients admitted to medical facilities following the second day of combat would die. This 'steady-state' mortality rate is 2 or 3 times higher than suffered by the Marine Corps in Vietnam or Korea. The model also predicted that almost 26% of all patients admitted to facilities during the first two days of combat would die. The medical workload was at its peak during this initial two-day period. All of the predicted deaths occurred at Medical Company facilities, where excessive delays in patient handling occurred, particularly in regard to triage, X-rays, and surgical procedures. (Author)

AD-A108 939/0 PC **A02**/MF **A01**
Army Medical Research Unit, Kuala Lumpur (Malaysia).
Leptospirosis in Nepal,
G. W. Brown, M. Madasamy, P. Bernthal, and M. G. Groves. 28 Oct 80, 3p
Grant DAMD17-80-G-9467
Pub. in Transactions of the Royal Society of Tropical Medicine and Hygiene, v75 n4 p572-573 1981.

No abstract available.

AD-A108 940/8 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Gonococcal Pilus Vaccine: Studies of Antigenicity, and Inhibition of Attachment,
Edmund C. Tramont, Jerald C. Sadoff, John W. Boslego, Jennie Ciak, and Daniel McChesney. 17 Feb 81, 10p
Pub. in Jnl. of Clinical Investigation, v68 p881-888 Oct 81.

No abstract available.

AD-A108 992/9 PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
A Mobile Surveillance System for Cerebrospinal Meningitis Control in Remote Rural Areas.
Interim rept.,
Warren R. Sanborn, Martin Schlumberger, Yada Adamou Alzouma, and Rene Triau. 1981, 13p Rept no. NAVHLTHRSCHC-81-4

Effective use of specific vaccines to control epidemic cerebrospinal meningitis requires early, precise etiologic diagnosis of cases. However, since the first cases often occur in areas remote from medical laboratories; etiologic diagnosis is seldom possible. A portable laboratory kit has been developed for rapid diagnosis of infectious diseases, including cerebrospinal meningitis, under field conditions, and the logistics of administering meningococcal vaccines have been simplified by using jet injectors, and stabilized meningococcal vaccines. A system employing these components for rapid diagnosis and vaccination was field-tested in Upper Volta with transport by a light plane. The 1979 cerebrospinal meningitis epidemic was found to be due mainly to Gr. C meningococci, but other etiologic agents were also identified. Thus. Gr. C vaccine was used, and therapy for other infections could be made consistent with rapid diagnostic test results. This rapid diagnosis and vaccination system may provide a suitable model for control of cerebrospinal meningitis epidemics in the rural areas of many countries. (Author)

AD-A108 995/2 PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
Health Effects of the Mid-Life Years among Navy Enlisted Men.
Interim rept.,
Anne Hoiberg. Jun 81, 14p Rept no. NAVHLTHRSCHC-81-25

The purpose of this article is (a) to compare the overall hospitalization rates of Navy enlisted men during a second (N = 30,393) and third decade (N = 19,471)

of a Navy career (the third includes the mid-life transition years), (b) to identify high risk occupational groups, and (c) to identify specific health problems associated with the mid-life years. Results show that third decade enlistees have considerably higher hospitalization rates than the second decade cohort for 10 of the 16 major diagnostic categories; the largest differences are observed for Endocrine, Metabolic, and Nutritional Diseases, Circulatory Diseases, Supplementary Classifications, and Diseases of the Digestive System. The high risk occupational groups include Hospital Corpsman, Construction/Manufacturing, and Engineering/Hull during the third decade and Hospital Corpsman, Mess Management Specialist, and Deck during the second decade. Specific diseases with relatively high rates during the mid-life years are ulcers, hypertension, ischemic heart disease, hernias, arthritis, pneumonias, bronchitis, hearing loss, and diabetes mellitus. Implications for the Navy Medical Department also are discussed. (Author)

AD-A109 009/1 PC **A02**/MF **A01**
Naval Dental Research Inst., Great Lakes, IL.
Glucan Synthesis by the Oral Bacterium Streptococcus mutans from Caries-Active and Caries-Free Naval Recruits,
I. L. Shklair, and R. W. Gaugler. 1981, 5p Rept no. NDRI-PR-81-08
Pub. in Archives of Oral Biology, v26 p683-686 1981.

No abstract available.

AD-A109 121/4 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Intracellular Replication of Leishmania tropica in Mouse Peritoneal Macrophages: Comparison of Amastigote Replication in Adherent and Nonadherent Macrophages,
Carol A. Nacy, and Carter L. Diggs. 7 May 81, 6p
Pub. in Infection and Immunity, v34 n1 p310-313 Oct 81.

No abstract available.

AD-A109 392/1 PC **A04**/MF **A01**
Naval Dental Research Inst., Great Lakes, IL.
Summaries of Research - Fiscal Year 1981.
Rept. for 1 Oct 80-30 Sep 81.
Nov 81, 54p Rept no. NDRI-PR-81-10

Brief summaries of research done from 1 October 1980 through 30 September 1981, including presentations, publications and distinguished visitors. (Author)

AD-A109 400/2 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Lymphocytapheresis,
Daniel G. Wright, Jacob Karsh, Anthony S. Fauci, John H. Klippel, and Albert B. Deisseroth. 1981, 10p
Pub. in Lymphocyte, p217-224 1981.

No abstract available.

HRP-0000604/9 PC **A02**/MF **A01**
Illinois Div. of Vocational and Technical Education, Springfield.
Planning Health Occupations Education at the Secondary Level - A Systems Approach.
1981, 23p

This pamphlet is intended to be used by teachers as a practical guide in planning high school Health Occupations Education programs. In planning health occupational programs, it is necessary to consider that health occupations students are being prepared either for employment within the community health care system, or for postsecondary technical education. Therefore, it is essential that preparatory programs meet the entry requirements of graduates' future employers or postsecondary schools. An advisory council, composed of health care practitioners, personnel managers, hospitals administrators, postsecondary school administrators, and others, would be the best source of information concerning these entry requirements. The first step in planning such a program is to identify specific community needs that can be satisfied through implementation of a secondary level health occupations program. Health care system personnel needs can be determined by either a telephone book survey or by a hospital occupations survey. Graduate followup studies, student interest surveys, and consultation with the state employment service will identify the interests and needs of students. The health occupations education program is described with orientation occurring in a cluster curriculum in the 9th and 10th grades. In the 11th and 12th grades entry level preparation is achieved through a health care aide program, while the technical education occurs at the postsecondary level.

HRP-0903751/6 PC **A04**/MF **A01**
New York State Health Advisory Council, Albany.
The Article 28 Certificate of Need Program in New York State: An Evaluation.
Apr 80, 65p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

New York State's current Certificate of Need Program (CON) under Article 28 of the Public Health Law is evaluated in this report. The relationship between the CON program, health planning and other health regulatory activities in New York State are explored; the purposes and expectations of the original CON program are outlined; and the measure of success which the program has had in fulfilling these purposes is examined. The CON program was enacted to deal with the following: the rapidly rising cost of health care; excess health facility construction and duplication of facilities and services; the rapid increase and demand for hospital admissions; evidence of overutilization of high cost inpatient facilities; and the lack of legal controls over the development of new hospitals or expansion of existing hospitals. The following were among the conclusions reached: CON seems to have increased planning and coordination among hospitals in their local communities, including development of shared services and joint medical programs; and CON controls appear to have initially accelerated time tables for facility construction and introduction of special services. In sum, available evidence suggests that CON is fulfilling many of its purposes, but that it has only recently begun to hold down capital expenditures.

HRP-0903792/0 PC **A04**/MF **A01**
Michigan Dept. of Public Health, Lansing.
Study of Selected Regulatory Programs.
29 Jun 81, 75p
See also Appendix 2, HRP-0903793.

This report on the study of selected regulatory programs is the product of an intense effort by the Michigan Department of Public Health and many other interested individuals and organizations to study the need for, and operation of, the Department's hospital, nursing home, clinical laboratory, x-ray facility, food service establishment and public swimming pool licensure programs. The study was conducted over a six month period in an open process, coordinated by a task force of the Department's Public Health Advisory Council, with the participation of over 50 interested individuals and organizations.

HRP-0903793/8 PC **A04**/MF **A01**
Michigan Dept. of Public Health, Lansing.
Study of Selected Regulatory Programs. Appendix II: Hospital Licensing Program.
Jul 81, 55p
See also HRP-0903792 and Appendix 3, HRP-0903794.

The Michigan Department of Public Health determined that health facility licensure is essential to public health. Hospital inspection and licensure was to be biennial rather than annual, with intensive monitoring of those hospitals with problems. The department was also interested in changes in law, regulation, or administrative patterns necessary to coordinate hospital inspections. Other issues considered were equity in hospital licensing fees and relief from the paperwork and reporting burden placed on hospitals by licensure and related programs. Hospital licensure program functions or activities were compared to hospital accreditation: survey, evaluation, and follow up; consultation and education; architectural plan review; complaint investigation; and enforcement activities.

HRP-0903794/6 PC **A04**/MF **A01**
Michigan Dept. of Public Health, Lansing.
Study of Selected Regulatory Programs. Appendix III: Nursing Home Licensing Program.
Jul 81, 60p
See also Appendix 2, HRP-0903793 and Appendix 4, HRP-0903795.

The nursing home licensure program in Michigan is described both from a historical perspective and in terms of current program accomplishments and problems. Public dissatisfaction with the overall quality of nursing home care was expressed in numerous public hearings, resulting in a number of reports indicating the need for stronger legislation and greater enforcement of minimum standards in nursing homes. Topics addressed include: changes in law, regulation, or administration patterns necessary to coordinate nursing home inspections and prevent duplication; equity in nursing home licensing fees; and relief from the reporting burden placed on nursing homes by licensure and related programs.

HRP-0903800/1 PC **A04**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Nursing Homes and Medicaid Certification: Study of the Fifty Percent Medicaid Requirement for Southeastern Pennsylvania Region Nursing Homes,
William C. Lane. Oct 80, 60p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

During fiscal year 1979, the health systems agency reviewed 18 nursing home projects to evaluate their use of Federal funds in instituting a building or facility expansion program. The projects totaled $27.9 million in value. They were also reviewed in terms of their commitment to providing services for Medicaid patients. The primary study purpose was to develop a model that would provide the agency with guidelines, standards, and criteria for establishing appropriate and acceptable levels of Medicaid occupancy for nursing home facilities. Analysis covered occupancy rate, cost of care, quality of care, and locational assessment. It appeared that nursing home occupancy rates were a function of the private pay market's structure; i.e., both proprietary and nonprofit facilities were geared toward private pay patients and Medicaid patients were generally accepted when the private pay demand was satisfied. Findings thus indicated that, as long as the Medicaid reimbursement rate remains low and no formal Medicaid occupancy rate requirements are established by the State, an excess demand for Medicaid beds will remain. The health systems agency feels it should continue to encourage both existing homes and those in the planning/construction stages to accept as many Medicaid patients as possible. Recommendations pertinent to State government and regional planning levels are offered to improve the balance between private pay patients and Medicaid patients in long-term care facilities. Appendixes contain materials mailed to study participants, the interview schedule, and footnotes and references.

HRP-0903801/9 PC **A08**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Locational Analysis for Nursing Home Services in the Southeastern Pennsylvania Health Service Area. Final Report: Delineation of Nursing Home Service Areas in Southeastern Pennsylvania.
1980, 160p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Prepared by Policy Research, Inc., Baltimore, MD.

Locational analysis was initiated in 1979 and completed in 1980 to define natural service areas for nursing home care in the 5-county Southeastern Pennsylvania region. Specific objectives were to identify areas which functioned homogeneously, to use this information in determining natural service areas for nursing homes, and to prepare maps of natural service areas. A literature search revealed information on factors affecting access to health care services, factors affecting nursing home utilization, and the application of locational/social area analysis techniques to planning for public facilities such as nursing homes. Analysis variables included age, sex, race, household head, and income. Cluster techniques were developed, with each cluster defining a nursing home service area. The locational analysis of nursing home services revealed that the region could logically be divided into 19 areas. Using the nursing home bed need formula contained in the 1980 health systems plan, the health systems agency began to determine the number of nursing home beds needed in each service area, the number of existing or approved nursing home beds in each area, the bed deficit or surplus in each area, and the number of additional beds available for development in each area. Applications of the study methodology are discussed. Appendixes contain supplementary information and

references on the locational analysis process, and supporting figures and maps are included.

HRP-0903803/5 PC **A03**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Procedures for Review of the Appropriateness of Existing Institutional Health Services.
Oct 80, 27p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Procedures are outlined that the health systems agency will follow in reviewing the appropriateness of institutional health services. The appropriateness review offers an opportunity for providers, consumers, and health planners to assess cooperatively the health system and to make changes that will benefit the community. Based on requirements delineated in P.L. 93-641 and amended in P.L. 96-79, each appropriateness review must be performed on an areawide basis. Appropriateness review procedures include the following steps: establishment of standards, criteria, and data needs for the institutional service reviewed; notification of involved parties and the public; data requests and verification; preliminary analysis and opportunity for initial comments; requesting comments, considering comments, and response development through agencies such as advisory councils; revision of findings; public comment period; governing board action on appropriateness review report; and transmission of report to the State agency. Access to written materials pertinent to any review is available to the general public for inspection and copying. Any person may request a public hearing to reconsider a health systems agency recommendation that results in an institution-specific recommendation. The relationship among appropriateness review, certificate of need, and Section 1122 is addressed. Information on services to be included in appropriateness reviews and a generalized review schedule are appended.

HRP-0903805/0 PC **A02**/MF **A01**
Central New York Health Systems Agency, Inc., Dewitt.
Operational Manual for Tompkins County Comprehensive Health Planning Council Officers and Committee Chairpersons.
17 Sep 80, 22p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

This manual was developed to assist the Health Planning Council in recruiting and orienting volunteer officers and committee chairpersons. It contains a suggested list of organizational activities to be performed by council members. As such, it may serve as a guide in delineating the role and responsibilities of volunteer officers and health planning staff. The manual covers the link between the Health Planning Council and the Central New York Health Systems Agencies with respect to administrative, program planning, volunteer recruitment, membership development, and public information activities. Duties and responsibilities of council officers are detailed (president, first vice-president, second vice-president, secretary, treasurer, and committee chairpersons). Included is an interview format to identify major functions of council personnel, Tompkins County's Comprehensive Health Planning Council bylaws, an Organizational chart of the council and of the health systems agency, and a position description of the health systems agency's associate planner.

HRP-0903806/8 PC **A05**/MF **A01**
Southern New Jersey Health Systems Agency, Bellmawr.
Mental Health, Alcohol and Drug Abuse Needs Assessment Report.
Jun 80, 91p
Prepared in cooperation wih New Jersey State Dept. of Health, Trenton.

A mental health, alcohol, and drug abuse (MHADA) needs assessment study was conducted from July 1979 through May 1980 in southern New Jersey. Study goals were to determine the prevalence of MHADA problems among the service area's population, to evaluate the availability and accessibility of MHADA services, and to assess MHADA service delivery. The study methodology employed both a key informant and an empirical approach to assess the need for MHADA services. For the 7-county survey area, 47 MHADA service providers were requested to provide data; 600 primary care physicians and 5 hospitals also provided information. Local drug and alcohol treatment providers identified women and youth as special groups in need of drug and alcohol abuse treatment. Service provision to the deinstitutionalized individual seemed to be the greatest mental health need of the elderly. Alcoholism treatment and drug abuse services appeared to be limited in the service area. Hospital data indicated that over 45 percent of the reported substance abuse cases for the white population involved individuals between 15 and 30 years of age. Overall findings demonstrate that additional mental health, drug abuse, and alcohol treatment services should include residential and day transitional services for the deinstitutionalized mental health patient, specialized services for women and youth, and further investigation of the geriatric population's needs. Supporting data are tabulated, and appendixes list service providers.

HRP-0903807/6 PC **A02**/MF **A01**
Southern New Jersey Health Systems Agency, Bellmawr.
General Agency Review Criteria.
Feb 80, 9p

This health systems agency's review procedure is a three-phase process based on need, program activities, and costs. Most need determinations are based on the health systems plan and the annual implementation plan. In some instances, however, judgments concerning need are made by combining both established guidelines and agency members' perception of need. Agency member knowledge of local conditions is often a more realistic determination of need than a formula or guideline used on a statewide basis. When reviewing a project in terms of need, some questions to be addressed are the affected population, special population characteristics, the existence of health maintenance organizations and their available services, biomedical and behavioral research projects intended to meet a national need for which local conditions offer special advantages, and the health care institution's need for energy conservation. Program activities should strive to establish working relationships with other organizations in the service area and to overcome social and linguistic barriers to service utilization. Costs should be evaluated in light of total program costs, the cost of an individual unit of care, and resource availability (capital and operating funds).

HRP-0903811/8 PC **A05**/MF **A01**
Wisconsin Statewide Study of Nursing and Nursing Education, Madison.
The Wisconsin Statewide Study of Nursing and Nursing Education Final Report: Volume I.
Oct 79, 89p
Sponsored in part by W. K. Kellogg Foundation, Battle Creek, MI., and Bureau of Health Planning, Hyattsville, MD. See also Volume 2, HRP-0903812.

The Nursing Study Committee, based upon its review of the suggestions made at public forums and through other means and upon its continued analysis, revised its recommendations and devised a plan for their implementation. After revision and editing, the NSC's final report (Volume I) was issued which contains fourteen recommendations, with the corresponding suggestions for implementation.

HRP-0903812/6 PC **A13**/MF **A01**
Wisconsin Statewide Study of Nursing and Nursing Education, Madison.
The Wisconsin Statewide Study of Nursing and Nursing Education Final Report: Volume II.
Oct 80, 298p
Sponsored in part by W. K. Kellogg Foundation, Battle Creek, MI., and Bureau of Health Planning, Hyattsville, MD. See also Volume 1, HRP-0903811.

Full background information to the Statewide Study of Nursing and Nursing Education (SSNNE) in Wisconsin is provided in this second volume of the Final Report.

HRP-0903816/7 PC **A02**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Lasting Illness: Challenge to Health Planning.
Sep 81, 20p
Contract PHS-HRA-232-79-0036

As the population of the United States grows older, chronic conditions which limit an individual's activities will command an increasing portion of the nation's health resources. Although a very extensive network of voluntary agencies which deal with such conditions exists in the country, coordinated community planning to meet the needs of those with lasting illness is relatively rare. Community health planning bodies are in a position to provide such coordination but have not often done so in the past. The tendency to place priorities in other areas, particularly acute care, has been a major cause of this oversight, and community planning bodies need to reconsider the priority accorded chronic conditions in their planning activities. This publication reviews the problem of lasting illness for community health planning agencies and emphasizes the need to establish a working relationship between planning organizations and existing community voluntary agencies which focus their efforts on lasting illness. Selected definitions relating to lasting illness are appended. Figures, notes, and a list of resource materials are included.

HRP-0903817/5 PC **A05**/MF **A01**
Jane Addams Coll. of Social Work, Chicago, IL.
Mental Health/Health Care Dilemmas in the 1980's: Agenda for Change, Conference Proceedings Held on October 10, 1980,
Shirley M. Buttrick, Cynthia J. Lee, and Hedy M. Weinberg. Aug 81, 79p
Prepared in cooperation with Illinois Commission on Mental Health and Developmental Disabilities, Illinois Dept. of Mental Health and Developmental Disabilities, Illinois Dept. of Public Health, and Illinois Dangerous Drugs Commission.

Multiple policy issues confronting mental health and health care professionals in the coming decade are addressed in these conference proceedings. An overview of major policy issues emphasizes that the knowledge base now needed for future policy decisions is not sufficient. Given that the definition and scope of mental health will be determined by the state of the economy and the nature of the political process, professionals are urged to be prepared to set service and funding priorities, define standards for services and service providers, and take responsibility for enforcing such standards among practitioners. A discussion of current funding structures and their impact upon the delivery of mental health services includes the foundation role and the need for a national policy to service the chronically mentally ill. The second section of the conference focused upon mental health and health care coordination. A holistic viewpoint within the medical center setting and the need for further exploration and research regarding the impct of mental health intervention are stressed. Alternative and innovative approaches were described in the third section.

HRP-0903825/8 PC **A03**/MF **A01**
Wisconsin Statewide Study of Nursing and Nursing Education, Madison.
Public Dimensions in Planning: A Study Process Model.
Mar 81, 41p
Sponsored in part by W. K. Kellogg Foundation, Battle Creek, MI., and Bureau of Health Planning, Hyattsville, MD.

The first in a series of three publications describing the Wisconsin Statewide Study of Nursing and Nursing Education (SSNNE), this volume explains the process used by the SSNNE and discusses some of the complications that resulted from combining a formal study with an elaborate public process. Phase I of the process involved the development of a decisionmaking network to ensure collective participation in the study. The study design for Phase II called for four methods of data collection. These were review of the literature, meetings with national consultants, surveys of key state populations, and a series of public forums. The third phase of the study saw the formulation of recommendations and a long-range plan.

HRP-0903827/4 PC **A04**/MF **A01**
North Central Georgia Health Systems Agency, Inc., Atlanta.
Report of the Heart Disease Task Force.
1981, 65p
Grant PHS-04-P-000219-06

Recommendations, criteria, and standards are presented for cardiac catheterization and open heart surgery services. The 24 recommendations include selected standards (some of which are repeated later in the standards section). They also specify which hospitals should and should not continue to provide services. Criteria and standards for cardiac catheterization are divided into six categories: availability (2 criteria, 11

standards); accessibility (8, 11); cost (2, 6); quality (14, 33); acceptability (6, 12); and continuity (5, 14). Those for open heart surgery are similarly categorized: availability (2 criteria, 10 standards); accessibility (8, 11); cost (2, 5); quality (14, 30); acceptability (6, 15); and continuity (5, 10). Introductory sections to the two sets of criteria and standards discuss the services and the rationale for some standards. Both sets were adopted from 1979 standards developed by MGT of America. Footnotes are included. To calculate bed need for cardiac intensive care units (ICUs), the projected 1986 population is multiplied by the cardiac ICU admission rate (7 per thousand), and that product is multiplied by an average length of stay of 3.5 days. The resulting figure is divided by 365 times an 80 percent occupancy rate. Tables, and illustrations are included.

HRP-0903828/2 PC **A03**/MF **A01**
South Central Health Planning and Development, Inc., Anchorage, AK.
Health Opinions - What Our Legislators Think of Certain Issues.
Apr 81, 37p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

South Central (Alaska) Health Planning and Development, Inc., conducted a survey of legislative attitudes toward major health issues. The agency hoped that the resulting report could serve as a tool for discussing important health issues. The HSA developed a questionnaire, included in the report, and distributed it in March of 1981 to 38 state representatives and senators from South Central Alaska. Twenty-six completed surveys were returned. The questionnaire contained 18 propositions to which the legislators could respond by checking Agree, Disagree, or Undecided. The issues included the problems of alcohol, cost, access, and prevention. The HSA has prepared charts showing the responses to each statement and has also included relevant goals from the HSP. Comments from the legislators about the issues are also included.

HRP-0903829/0 PC **A04**/MF **A01**
Ventura-Santa Barbara Health Systems Agency, Ventura, CA.
Report on Premature Death in Oxnard Prepared for the Oxnard Health Status Task Force of the Ventura-Santa Barbara Health Systems Agency.
24 Jun 81, 68p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

The Health Status Task Force undertook a study of mortality from 1975-1979. A staff report in 1980 indicated there were more deaths in the City of Oxnard than expected, given the city's age composition. Potential years of life lost (PYLL) was calculated for Ventura County and for the City of Oxnard. Comparisons were made with statewide PYLL after adjusting for age distribution. The overall PYLL for Ventura County was lower than that of California, while the PYLL for Oxnard was higher than either the County or the State. Leading causes of premature deaths were identified for the County and the City. Analysis was done for age group and racial group; analysis by census tract was also done by Oxnard. For Ventura County, suicides for whites and homicide, chronic liver disease, and cirrhosis death for Spanish-surnamed are major problems. In Oxnard, homicide, chronic liver disease, and cirrhosis, and suicide are major causes of premature death.

HRP-0903830/8 PC **A06**/MF **A01**
Northwest Connecticut Health Systems Agency, Waterbury.
Long-Term Care Committee Report on Nursing Home Utilization, Bed Requirement Projections, and Policy-Related Questions.
May 81, 122p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

The availability of and need for long-term care beds were determined for the year 1985. Patient days for the 1978-79 year were compiled, along with administrative patient days in hospitals for individuals awaiting long-term care placement. Only the total number of long-term care beds was considered, not inividual levels of care such as skilled nursing or intermediate care. It was determined that approximately 500 more long-term care beds will be required in 1985. Review panels are encouraged to consider the following in appropriateness reviews: legitimate service area and population served; new beds that will be made available; compatibility between the number of new beds proposed and the need for beds; the cost-effectiveness of building or converting units according to licensure/mandated staffing patterns; and the desirability of having multiple levels of care in a single facility. Further study is recommended to define specific levels of psychiatric need and to evaluate the feasibility of alternatives to nursing home care (partial hospitalization, fullway houses, and halfway houses). Extensive supporting data are contained in appendices.

HRP-0903831/6 PC **A04**/MF **A01**
New York State Health Advisory Council, Albany.
Toward a Balanced Health Manpower Policy.
Sep 79, 59p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Planning to meet health manpower needs was the focus of a New York task force which considered both long-term and short-term health manpower policy issues, a policy mechanism for health manpower, and health manpower information systems. The task force believes that, as of 1979, the physician supply for the State's foreseeable future is adequate. While no further expansion of medical education is needed, shifts in school enrollment locations and in the use of clinical campuses in rural and urban areas may serve to distribute physicians to underserved areas. The task force recommends that New York be fully supportive of Federal actions to decrease dependence on foreign medical graduates. It additionally recommends that the State expand training in primary care specialties, with an offsetting decrease in training for medical/surgical specialties. Area health education centers are viewed as one way to alleviate the geographic maldistribution of physicians and as a means of decentralizing the education of medical and other professionals into rural and urban medically underserved areas. A coordinated arrangement for collecting and analyzing health manpower information is proposed. An expanded role for nurses and improving the access of minorities and the disadvantaged to health careers are discussed.

HRP-0903832/4 PC **A03**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Report on Appropriateness Review of Burn Care Services in Southeastern Pennsylvania.
17 Dec 80, 35p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

The appropriateness of burn care services in Southeastern Pensylvania was surveyed. A distinction was made in the analysis between 'appropriate' at the areawide level and 'appropriate' at the institution-specific level. The survey sample included 39 hospitals in a 5-county area. Burn care was evaluated with respect to cost, continuity, accessibility, availability, quality, and acceptability. Burn centers, representing a concentration of sophisticated resources capable of treating the entire range of burn injuries, were also surveyed. At general hospitals, all burn care services were found to be appropriate at both areawide and institution-specific levels. Intermediate level hospitals had utilization review mechanisms in place and referral and treatment protocols, although some lacked burn-trained intensive care unit nurses, a written burn therapy plan, and/or a patient coding system which indicated percent of body surface burned. Burn centers were found to be appropriate at both areawide and institution-specific levels. The development of burn therapy plans is recommended, along with the use of occupational therapy services to simplify patient care activities. Supporting data are tabulated.

HRP-0903833/2 PC **A09**/MF **A01**
New York State Health Advisory Council, Albany.
Toward a Balanced Health Manpower Policy: Supplement.
17 Sep 79, 177p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

This New York task force was concerned with both long-term and short-term health manpower policy issues, a policy mechanism for health manpower, and health manpower information systems. It determined that health manpower planning and policy making should be determined by population needs and resource availability and that the physician supply in New York State is adequate to meet the State's foreseeable future. Increased enrollment in medical schools has had no significant impact on health status indicators or on leading causes of morbidity and mortality. Problems concern the State's declining minority enrollment in medical schools and the supply of medical specialists and subspecialists. It is felt that an area health education center can substantially improve primary health care delivery while enhancing and coordinating major health manpower objectives. Recommendations pertinent to these conclusions are offered that focus on physician supply and the health care system, New York's geographic and specialty distribution of physicians, the State's medical schools, foreign medical graduates, and health careers for minorities and the disadvantaged. A list of references is included.

HRP-0903838/1 PC **A04**/MF **A01**
New York State Health Advisory Council, Albany.
Problems of Offshore Medical Schools: An Overview.
Jan 81, 53p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Problems associated with students who attend foreign medical schools for their first 2 years and then complete clinical requirements in the United States are addressed. The main problems center around a citizen's right to pursue the career of his/her choice, whether a State is obligated to finance or promote the training of U.S. citizens at foreign medical schools in the face of a physician surplus, alternatives for establishing and enforcing standards for medical education and licensure, and whether a State should assure that all physicians licensed to practice in the State meet the same education and training standards. The New York State Board of Regents has proposed regulations on clinical clerkships which have received varying reactions. Rather than a program to register or accredit foreign medical schools, the Board of Regents proposes an evaluative mechanism for approving schools that want to place clinical clerks in State hospitals. Appendixes contain supplementary information on the foreign medical education issue.

HRP-0903839/9 PC **A05**/MF **A01**
Central New York Health Systems Agency, Inc., Dewitt.
Madison County Laboratory Study.
Final rept.
Oct 80, 81p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Alternatives for operating the Madison County Library were considered by an acute care study committee, and the laboratory's financial impact on Oneida City Hospital and Community Memorial Hospital was examined. Analysis of Laboratory operations from 1976-79 revealed a stabilized volume of laboratory tests performed. In addition to the stabilized volume of tests, other major obstacles to continued laboratory viability were the lack of a laboratory fee increase since 1976 and high costs (personnel, equipment, and supplies). For the 1980-82 period, three alternatives for laboratory operation were identified: continued maintenance county control; hospital operation and coordination; or operation within a multihospital system. The committee recommended that the laboratory be converted to ownership by the two hospitals effective January 1, 1981; that, once conversion occurs, a study be undertaken to determine the laboratory's role in a multihospital system; and what laboratory study recommendations be implemented in conjunction with the acute care study. Supporting data from the analysis are appended.

HRP-0903840/7 PC **A02**/MF **A01**
Central Jersey Health Planning Council, Inc., Hightstown.
Long-Term Care in Central Jersey: Special Report.
Mar 81, 19p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Physical aspects of long-term care (LTC) and alternatives to institutionalization are discussed. The LTC concept encompasses both institutional and noninstitutional settings in which care is provided to the chronically ill, the disabled, and the physically and mentally handicapped over an extended period of time. In Central New Jersey, the greatest proportion of LTC users are persons 65 years and over. Three levels of LTC in the region are LTC nursing facilities, sheltered care facilities, and home health care. How an individual becomes involved in the LTC system and who is eligible

for Medicaid are explained. Attention is paid to the quality of LTC, community support services, community-based alternatives, boarding homes, medical day care, congregate housing, and hospices. A glossary is provided, along with a list of agencies and organizations associated with LTC provision in Central New Jersey.

HRP-0903842/3 PC **A03**/MF **A01**
Central Jersey Health Planning Council, Inc., Hightstown.
Study on the Future Uses of Raritan Valley Hospital (Draft).
May 79, 42p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

This study examined community health needs for and the financial viability of selected health services at Raritan Valley Hospital in Central New Jersey. An ad hoc committee was formed to discuss the hospital's future in meeting health care needs of the region. In seeking to avoid hospital closure, the committee recognized the facility as a valuable health care resource in the area. Subsequent analysis revealed a clear need for emergency medical services, long-term care, ambulatory care (health maintenance organization), hospice, occupational health care, mental health services, and senior citizens centers. Questionable need was indicated for rehabilitation, same day surgery, and private physician offices. There was no need for acute care to be provided by the hospital. With the exception of emergency medical services, hospice, and senior citizens centers, financial viability was demonstrated for clearly needed services. It is recommended that the College of Medicine and Dentistry of New Jersey plan for services at Raritan Valley Hospital in accordance with need.

HRP-0903854/8 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: State Summaries, Volume 1, Part 1.
Aug 81, 321p
Contract PHS-HRA-232-80-0050
See also Volume 1, Part 2, HRP-0903855.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903855/5 PC **A13**/MF **A01**
National League for Nursing, Inc., New York.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: State Summaries, Volume 1, Part 2.
Aug 81, 297p
Contract PHS-HRA-232-80-0050
See also Volume 1, Part 1, HRP-0903854.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first wo editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those prsons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903856/3 PC **A11**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Alabama, Volume 2, Part 1.
Aug 81, 241p
Contract PHS-HRA-232-80-0050
See also Volume 2, Part 2, HRA-0903857.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, for data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State repots) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903857/1 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Alabama, Volume 2, Part 2.
Aug 81, 324p
Contract PHS-HRA-232-80-0050
See also Volume 2, Part 1, HRP-0903856.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903858/9 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Arkansas, Volume 5, Part 1.
Aug 81, 257p
Contract PHS-HRA-232-80-0050
See also Volume 5, Part 2, HRP-0903859.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903859/7 PC **A13**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Arkansas, Volume 5, Part 2.
Aug 81, 294p
Contract PHS-HRA-232-80-0050
See also Volume 5, Part 1, HRP-0903858.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903860/5 PC **A09**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Arizona, Volume 4.
Aug 81, 184p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903861/3 PC **A09**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Alaska, Volume 3.
Aug 81, 197p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consists of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those prsons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903955/3 PC **A03**/MF **A01**
Bureau of Health Planning, Hyattsville, MD.
Program Policy Notices of the Bureau of Health Planning (1981).
Feb 82, 32p

The compendium comprises all Program Policy Notices issued by the Bureau of Health Planning, Health Resources Administration, for the Fiscal Year 1981. It has been compiled as a reference guide for Federal policy in FY 1981, relative to procedures for Certificate of Need reviews, revisions to governing body requirements, transition strategies, and determination of priorities for Health Systems Agencies and State Health Planning and Development Agencies.

PB82-140518 CP **T13**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS) Data Tape, Final Version, 1981.
Data file,
Richard M. DuBois, and Layton Davis. 1981, mag tape DHEW/DF-81/004
Contract PHS-HRA-230-76-0099, Grant PHS-HS-00175
Supersedes PB81-198186.
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-140526, PB82-140534, PB82-140542, and PB82-140559. For computer program tapes, see PB82-140567.

The overall goals of PROMIS are that (1) the medical record, utilizing a 'problem-oriented' approach, be the instrument whereby the following objectives can be implemented, and that (2) the technique of record keeping be the basis for the beginning realization of these goals and that (3) a real-time computer system be used to overcome the data distribution and time barriers that are insurmountable on a manual basis using conventional hospital and clinical medical records. The objectives are to (1) facilitate good patient care by making immediately available (in minutes) to the individual physician a complete, updated list of problems on any patient and by providing simultaneously, as a unit, all the data in sequence (narrative, laboratory, etc.) pertinent to any of these problems; (2) make possible epidemiological studies and other research endeavors in terms of problems, having all the data on any given problem immediately available; (3) make possible a medical audit; (4) make possible a business audit to assess the physical, financial and time resources that go into the solution or management of a given problem; and (5) provide problem-oriented records that can serve as the basis for clinical medical education. To realize these objectives PROMIS, for the good of the patient is not dependent upon the memories of individuals; preserves without ambiguity the logic of all actions; coordinates the efforts of all persons involved in the patient's care; and provides feedback with which the performance of health care providers may be evaluated and improved. The full resources of PROMIS are available at all times to all persons involved in the care of a patient, each of whom interact directly with the computerized system without the need for mediating persons or paper. Touch-sensitive screens are used to display all the information in the system as it is needed by individual users. By selecting choices (and occasionally typing in data), a user is guided through a logical sequence of displays structuring his interaction with general and patient-specific medical data and building a 'message' to be stored in the patient's record. The PROMIS system emphasizes responsiveness and reliability. An interactive display medium must be responsive if users are not to become frustrated. Redundancy is built into the system on many levels to prevent loss of data or access to data should a failure occur. Data tapes 1 through 12 house a copy of all the PROMIS frames and tables, and the data structures comprising the PROMIS medical data base. The frames and tables are used to store data, to create displays for viewing on a CRT screen, and to branch from display to display when choices on the displays are selected. Each frame or table is a paragraph. A logical group of paragraphs is a file. The number of files on any tape is arbitrary. To interpret these data structures, the Functional Specification of a PROMIS Instance System, Level II is required (NTIS Interim Report No. NCHSR 81-67).

PB82-140526 PC **A14**/MF **A01**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS). PROMIS Functional Specification, Volume 1.
Final rept.
Sep 81, 325p DHEW/DF-81/004A
Contract PHS-HRA-230-76-0099, Grant PHS-HS-00175
Supersedes PB81-198186. For system on magnetic tape, see PB82-140518, and PB82-140567. See also Volume 2, PB82-140534.

The problem oriented medical philosophy is embodied in a computer system in operation at the Medical Center Hospital of Vermont in Burlington, Vermont, developing solutions to important problems in medicine via innovations in the practice of medicine and in the design and use of computer hardware and software. Users of the system make selections on displays, presented at touch-screen terminals, which embody a guidance system of medical knowledge and data received from electronically prepared records which themselves have been generated by interactions with the guidance system. The Functional Specification (three volumes) describes the building blocks of this system--the medical guidance structure, characteristics of the display medium, medical data base language, application programming languages, software modularization and file system--and is structured to allow people of varying technical and medical interests and capabilities to understand and implement some or all of the concepts and tools of PROMIS.

PB82-140534 PC **A13**/MF **A01**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS). PROMIS Functional Specification, Volume 2.
Final rept.
Sep 81, 280p DHEW/DF-81/004B
Contract PHS-HRA-230-76-0099, Grant PHS-HS-00175
Supersedes PB81-198194. For system on magnetic tape, see PB82-140518, and PB82-140567. See also Volume 1, PB82-140526, and Volume 3, PB82-140542.

The problem oriented medical philosophy is embodied in a computer system in operation at the Medical Center Hospital of Vermont in Burlington, Vermont, developing solutions to important problems in medicine via innovations in the practice of medicine and in the design and use of computer hardware and software. Users of the system make selections on displays, presented at touch-screen terminals, which embody a guidance system of medical knowledge and data received from electronically prepared records which themselves have been generated by interactions with the guidance system. The Functional Specification (three volumes) describes the building blocks of this system--the medical guidance structure, characteristics of the display medium, medical data base language, application programming languages, software modularization and file system--and is structured to allow people of varying technical and medical interests and capabilities to understand and implement some or all of the concepts and tools of PROMIS.

PB82-140542 PC **A13**/MF **A01**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS). PROMIS Functional Specification, Volume 3.
Final rept.
Dec 80, 289p DHEW/DF-81/004C
Contract PHS-HRA-230-76-0099, Grant PHS-HS-00175
For system on magnetic tape, see PB82-140518, and PB82-140567. See also Volume 2, PB82-140534, and PB82-140559.

The problem oriented medical philosophy is embodied in a computer system in operation at the Medical Center Hospital of Vermont in Burlington, Vermont, developing solutions to important problems in medicine via innovations in the practice of medicine and in the design and use of computer hardware and software. Users of the system make selections on displays, presented at touch-screen terminals, which embody a guidance system of medical knowledge and data received from electronically prepared records which themselves have been generated by interactions with the guidance system. The Functional Specification (three volumes) describes the building blocks of this system--the medical guidance structure, characteristics of the display medium, medical data base language, application programming languages, software modularization and file system--and is structured to allow people of varying technical and medical interests and capabilities to understand and implement some or all of the concepts and tools of PROMIS.

PB82-140559 PC **A07**/MF **A01**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS) Tape Documentation (Frozen System).
Sep 81, 145p DHEW/DF-81/004D
For system on magnetic tape, see PB82-140518, and PB82-140567. See also PB82-140542.

This document describes the PROMIS tape. It contains information on character set, tape verification, data base frames and tables, source file description, and the contents of each tape.

PB82-140567 CP **T14**
Vermont Univ., Burlington. PROMIS Lab.
Automated Problem-Oriented Medical Information System (PROMIS) Source Tape, Final Version, 1981.
Software,
Richard M. DuBois, and Layton Davis. 1981, mag tape DHEW/DF-81/005
Contract PHS-HRA-230-76-0099, Grant PHS-HS-00175
Supersedes PB81-198210.
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-140526, PB82-140534, PB82-140542, and PB82-140559. For data tapes, see PB82-140518.

The overall goals of PROMIS are that (1) the medical record, utilizing a 'problem-oriented' approach, be the instrument whereby the following objectives can be implemented, and that (2) the technique of record keeping be the basis for the beginning realization of these goals and that (3) a real-time computer system be used to overcome the data distribution and time barriers that are insurmountable on a manual basis using conventional hospital and clinical medical records. The objectives are to (1) facilitate good patient care by making immediately available (in minutes) to the individual physician a complete, updated list of problems on any patient and by providing simultaneously, as a unit, all the data in sequence (narrative, laboratory, etc.) pertinent to any of these problems; (2) make possible epidemiological studies and other research endeavors in terms of problems, having all the data on any given problem immediately available; (3) make possible a medical audit; (4) make possible a business audit to assess the physical, financial and time resources that go into the solution or management of a given problem; and (5) provide problem-oriented records that can serve as the basis for clinical medical education. To realize these objectives PROMIS, for the good of the patient is not dependent upon the memories of individuals; preserves without ambiguity the logic of all actions; coordinates the efforts of all persons involved in the patient's care; and provides feedback with which the performance of health care

providers may be evaluated and improved. The full resources of PROMIS are available at all times to all persons involved in the care of a patient, each of whom interact directly with the computerized system without the need for mediating persons or paper. Touch-sensitive screens are used to display all the information in the system as it is needed by individual users. By selecting choices (and occasionally typing in data), a user is guided through a logical sequence of displays structuring his interaction with general and patient-specific medical data and building a 'message' to be stored in the patient's record. The PROMIS system emphasizes responsiveness and reliability. An interactive display medium must be responsive if users are not to become frustrated. Redundancy is built into the system on many levels to prevent loss of data or access to data should a failure occur. All software structures forming the computerized Problem-Oriented Medical Information System (PROMIS) are included on computer program source tapes 13 through 15. The source files are written in a number of languages, the most prevalent being the PROMIS Programming Language (PPL), designed expressly for this application. The code bodies represented by these source files from subsystems, each of which is responsible for a phase of the processing of requests entered at terminals by system users. Most of these requests are in the form of choice selection, performed by touching the screen in the vacinity of the choice. The selection is processed, generating requests at various levels of system activity, depending upon the request, such as storage into patient records, terminal or disk I/O, display creation, retrieval of data from patient records, etc.

PB82-141011 PC **A09**/MF **A01**
North Carolina Univ. at Chapel Hill.
The Family's Demand for Health: A Rural Investigation, Executive Summary.
Final rept. 30 Jun 76-31 Dec 77,
Lawrence Miners. Dec 81, 180p NCHSR-81-246
Grant PHS-HS-02417

The purpose of this project was to construct a household model of the demand for medical care and to test the theoretical results of the model with data from a rural southern community. The determinants of the demand for health care are important for a number of reasons. First, the quantification of these factors is necessary to properly assess the health status and medical care needs of the community and to provide programs to increase consumer awareness and knowledge of the health care sector. Secondly, data pertaining to consumer demand can be used by both policy makers and physicians to more accurately meet the needs of the patient and to provide health care in a setting more conducive to the patient's requirements.

PB82-142613 Mag Tape $185.00
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, Second). Model Gram and Nutrient Composition Data Tape. Catalog Number 5702 and 5703.
Data file,
Connie Dresser, and Mary Dudley. 1980, mag tape NCHS/DF-81/019
Supersedes PB81-232878.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-142621.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-80, was designed to measure and monitor the nutritional status and health of the U.S. population ages 6 months through 74 years. A similar survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy tests, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. The Model Gram tape consists of 2,605 food items with food groups; food codes; alphanumeric descriptions; preferred food model codes and gram conversion factors. The Nutrient Composition tape contains the actual nutrient analysis in 100 gram edible portions of all foods listed in the Model Gram tape. These tapes are essentially an interpretive tool for use as input to a computer analysis of NHANES II 24-Hour Recall dietary data, or data from a survey employing similar methodology.

PB82-142621 PC **A04**/MF **A01**
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, Second). Model Gram and Nutrient Composition Tapes. Catalog Numbers 5702 and 5703.
Final rept. 1976-80.
Dec 81, 53p NCHS/DF-81/019A
For system on magnetic tape, see PB82-142613. Supersedes PB81-232886.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-80, was designed to measure and monitor the nutritional status and health of the U.S. population ages 6 months through 74 years. A similar survey NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy tests, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. The Model Gram tape consists of 2,605 food items with food groups; food codes; alphanumeric descriptions; preferred food model codes and gram conversion factors. The Nutrient Composition tape contains the actual nutrient analysis in 100 gram edible portions of all foods listed in the Model Gram tape. These tapes are essentially an interpretive tool for use as input to a computer analysis of NHANES II 24-Hour Recall dietary data, or data from a survey employing similar methodology.

PB82-142639 Mag Tape $305.00
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, Second). 24-hour Recall - Specific Food Item Tape.
Data file,
Connie Dresser, and Mary Dudley. 1980, mag tape NCHS/DF-81/020
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and pariy. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-142647.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-80, was designed to measure and monitor the nutritional status and health of the U.S. population ages 6 months through 74 years. A similar survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy tests, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. This data tape contains demographic characteristics; a separate record for each food item consumed by each examined person with the amounts of calories and 7 selected nutrients contained in those foods; ingestion period; approximate time of day food consumed and food source for 20,322 sample persons ages 6 months through 74 years examined during NHANES II.

PB82-142647 PC **A05**/MF **A01**
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, Second). 24-Hour Recall - Specific Food Item Tape. Catalog Number 5704.
Final rept. 1976-80.
24 Dec 81, 91p NCHS/DF-81/020A
For system on magnetic tape, see PB82-142639.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-80, was designed to measure and monitor the nutritional status and health of the U.S. population ages 6 months through 74 years. A similar survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy tests, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. This data tape contains demographic characteristics; a separate record for each food item consumed by each examined person with the amounts of calories and 7 selected nutrients contained in those foods; ingestion period; approximate time of day food consumed and food source for 20,322 sample persons ages 6 months through 74 years examined during NHANES II.

PB82-142662 PC **A10**/MF **A01**
National Center for Health Statistics, Hyattsville, MD. Div. of Vital Statistics.
Vital Statistics Mortality Multiple Cause Data, Detail, 1971. Tape Contents and Documentation Package.
1980, 220p NCHS/DF-81/021
For system on magnetic tape, see PB82-142654.

Vital Statistics data relating to mortality provide demographic, underlying and multiple cause-of-death data for deaths occurring during the calendar year. The data are based on information abstracted from all death certificates filed in vital statistics offices of each State and the District of Columbia. Death is defined as the permanent disappearance of any evidence of life at any time after live birth, therefore, data relating to fetal deaths are not included in the data. Demographic data include variables such as date of death, age, race, sex and geographic area. Underlying and multiple cause-of-death data have been coded to the causes shown in the Eighth Revision of the International Classification of Diseases, Adapted for Use in the United States. Death and infant mortality rates and/or denominators required to derive such rates are not on the tapes. The number of deaths and the death and infant mortality rates for selected demographic and cause variables are published annually in Vital Statistics of the United States, Volume II, Parts A and B. A technical appendix giving information regarding the historical aspect and limitations of the data is included in the published volumes and the documentation for the data tapes. Specialized reports are published periodically in Vital and Health Statistics. Multiple cause-of-death data and the 'each cause' level of detail is included as Appendix I of the multiple cause-of-death documentation.

PB82-151291 PC **A11**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Development of Systems for the Determination of Elements in Industry Atmosphere, Blood and Urine.
30 Sep 73, 237p

The report describes methods for the determination of lead in blood, urine and air; arsenic in blood, urine and air; cadmium in blood, urine and air; indium in blood, urine and air; gallium in air and urine; and antimony in blood, urine and air. All methods include procedures for sampling, shipping and storage. The methods for cadmium, lead and indium show total system precision and accuracy on the order of 6 to 10% relative standard deviation. The methods for arsenic showed 6% precision with a systematic accuracy bias of 0.3 in preliminary tests. Procedures were developed and applied for routine 50 to 100 sample per day throughputs for all methods tested.

PB82-153206 PC **A06**/MF **A01**
Russell (Harold) Associates, Inc., Waltham, MA.
An Evaluation of the Implementation of State Protection and Advocacy Systems for the Developmentally Disabled (Volume I).
Final rept.
15 May 80, 117p AASHD-78-16
Contract DHEW-105-78-5002
See also PB82-153214.

Under amendents to Developmental Disabilities Services and Facilities Construction Act of 1970, PL 91-517, and the Mental Retardation Facilities and Com-

munity Health Centers Construction Act of 1963, PL 88-164, states were required to have in effect by October 1, 1977 a system to protect and advocate for the rights of persons with developmental disabilities (42.U.S.Cs 6012 (a) (1). It became the task of the Bureau of Developmental Disabilities to assist in the provision of a system of protection of an advocacy for these rights. This project accomplished the following purposes: evaluated the implementation of protection and advocacy systems, reviewed and evaluated those performance standards which currently exist on the state level, and developed overall performance standards for use by the Bureau of Developmental Disabilities. (The second chapter of this Vol. presents a set of recommendations.)

PB82-153263 Not available NTIS
National Bureau of Standards, Washington, DC.
Apatitic Fluoride Increase in Enamel from a Topical Treatment Involving Intermediate CaHPO4.2H2O Formation, an 'In vivo' Study,
L. C. Chow, M. K. Guo, C. C. Hsieh, and Y. C. Hong. 1981, 8p
Sponsored in part by American Dental Association Health Foundation, Chicago, IL.
Pub. in Caries Res. 15, p369-376 1981.

Previous laboratory and animal studies have reported high levels of apatitic fluoride uptake from a topical fluoride procedure in which teeth were pretreated with an acidic solution saturated with respect to CaHPO4.2H2O (DCPD) prior to the fluoride treatment. A study was initiated to determine the fluoride uptake from this procedure under clinical conditions. A microbiopsy technique was used to measure enamel fluoride contents before, 1 month after, and 3 months after an application of an acidulated phosphate fluoride (APF) solution alone or in combination with a DCPD pretreatment on the maxillary incisors of 50 fourth-grade children in a non-fluoride area. One month after treatment, there was no significant difference in enamel fluoride concentration between APF and control groups. The DCPD/APF treatment produced mean fluoride uptakes of 1,011 plus or minus 134 ppm (n = 50) and 2,042 plus or minus 221 ppm (n = 47) in the outer 3.5 micrometers of enamel measured 1 and 3 months, respectively, after treatment. The results indicate that the DCPD pretreatment can substantially increase permanently bound fluoride uptake under clinical conditions.

PB82-153818 PC **A06**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
An Evaluation of the Analytical Performance and Correlation with Myocardial Infarction of Seventeen Methods for Determining Creatine Kinase Isoenzymes.
Final rept.
May 81, 111p TR-1608-005A, FDA/BMD-82/22
Contract FDA-223-74-5253

Using a literature survey for background information, a protocol was developed for evaluating the product characteristics or performance claims of products used for the detection of CK isoenzymes this report discusses three basic evaluations of product performance: (1) Determination of the precision of repeated analysis of frozen serum pools at three different activity levels using three different reagents lots, (2) analysis of samples obtained from patients admitted to a coronary intensive care unit in order to correlate the test results with physician diagnosis of the occurrence of myocardial infarction, (3) examination of the correlation of the quantitative results obtained from each method with the 'reference method'.

PB82-154360 PC **A02**/MF **A01**
California Univ., San Francisco.
Non-Invasive Detection and Quantification of Atherosclerotic Lesions.
Annual rept. no. 1, 30 Sep 80-30 Sep 81,
Leon Kaufman, B. Brundage, L. E. Crooks, R. Havel, and J. Kane. 1 Dec 81, 23p
Contract N01-HV-0-2928

The report presents studies using the small imager to characterize the capabilities of the system to measure area and velocity of flow. The research includes constructing phantoms with variable diameter tubes connected in series, so that three separate flow velocities are presented in each image and calibrating accuracy of area determination as a function of tube diameter and flow velocity.

PB82-154550 PC **A13**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
An Evaluation of the Physiological Role of Bilirubin and the Methods Employed for Its Determination in Serum.
Technical rept.,
Lynn Astle. 3 Mar 76, 284p TR-163-002, FDA/BMD-82/24
Contract FDA-223-74-5253

This report consists of a literature review which discusses the physiology of bilirubin and the determination of bilirubin in clinical samples, including errors due to calibration and test procedures. Three methods of bilirubin determination are examined: diazo, spectrophotometric, and oxidative procedures.

PB82-154568 PC **A12**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
Investigation of Procedures and Products Used for Coagulation Studies.
Final rept.,
R. N. Potter, and L. Astle. 9 Jan 76, 265p TR-164-004, FDA/BMD-82/26
Contract FDA-223-74-5253

This report consists of an analysis of the current state of the art of prothrombin time (PT) and partial thromboplastin time (PTT) methodologies, a discussion of the clinical significance of PT and PTT tests, a market survey and evaluation of coagulation product characteristics and labeling material, and a historical discussion of blood coagulation with respect to the development of PT and PTT tests.

PB82-159047 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Legislation Authorized Benefits Without Adequate Evidence of Black Lung or Disability.
Report to the Congress.
19 Jan 82, 55p HRD-82-26

The Federal Coal Mine Health and Safety Act, as amended, authorized the Department of Labor to approve black lung claims based on conflicting or inconclusive medical evidence, affidavits from spouses and others, or presumptions based on years of coal mine employment. GAO believes that medical evidence should be the basis for determining disability and death from black lung and that benefits should be awarded only to miners who are totally disabled by black lung or to their survivors. This report (1) suggests that the Congress consider amending the black lung legislation and (2) recommends that Labor provide more guidance on the evidence needed to rebut certain legislative presumptions and establish additional procedures for resolving conflicting medical evidence. Legislation passed by the Congress in December 1981 should resolve a number of GAO's concerns and result in better evidence to support approval of future black lung benefit claims.

PB82-862012 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Septic Shock: Clinical Features and Therapy. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 115p

This bibliography contains citations concerning the clinical features and management of septic shock. The causative agents, including both Gram negative and Gram positive bacteria are discussed. The most prominently mentioned are Escherichia coli and Pseudomonas, Proteus, Klebiella and Streptococcus species. The portal of entry and clinical aspects, including intravascular coagulation, renal failure and pulmonary edema, are considered. Treatment and mortality rate are also discussed. Specific case studies and animal studies are noted. (Contains 104 citations fully indexed and includes a title list.)

PB82-862590 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ultrasound in Medical Diagnosis. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 177p
Supersedes PB81-861858.

This bibliography contains citations concerning the applications of ultrasound to medical diagnosis. The detection of tumor masses by ultrasonic techniques is stressed. The use of ultrasound in the diagnosis of diseases other than cancer is also discussed. Case histories are reported. (This updated bibliography contains 194 citations, 23 of which are new entries to the previous edition.)

PB82-930500 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Oncofetal Proteins.
Cancergram CB01.
1982, 12 issues
Supersedes PB81-930500.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram examines the association between tumor antigens and other tumor products, and similar markers manifested by embryonic and fetal cells. Included within this purview are carcinoembryonic antigens (CEA).

PB82-930600 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Immunobiology and Cancer: The Major Histocompatibility Complex.
Cancergram CB03.
1982, 12 issues
Supersedes PB81-930600.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram covers investigations of all mammalian histocompatibility systems, HLA, HLB, H-2, AgB, Ia, and other minor histocompatibility antigens. It includes other immunogenetically defined processes such as MLC and MLR. Specific emphasis will be placed on the following: isolation, characterization and structure, gene mapping, association with disease, and phenotypic alterations.

PB82-930700 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Immunobiology and Cancer: Antibodies and Humoral Immunity.
Cancergram CB08.
1982, 12 issues
Supersedes PB81-930700.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

Antibodies generated against in situ and transplanted tumors are within the scope of this Cancergram. Abstracts included concern studies of both exogenously administered (immunization) and endogenously produced antibodies. Autoimmunity is included when related to anti-tumor activity. Any other immune resistance factors not readily identifiable as tumor antibodies but with similar characteristics are also covered. Circulating antigen-antibody complexes, and other factors which block the immune response to tumors, are of high interest.

PB82-930800 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Immunobiology and Cancer: Tumor-Associated Antigens.
Cancergram CB05.
1982, 12 issues
Supersedes PB81-930800.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram covers all tumor-associated and tumor-specific antigens (TSTA, TMTA, TATA, and TAA) with the exception of oncofetal antigens (covered by Cancergram B001) and viral antigens unrelated to neoplasia. Abstracts included concern both intracellular and surface antigens, with emphasis on the latter. Also covered are antigens from tumors derived from patients (colon cancer, leukemias, etc.) when studied from a non-clinical standpoint. Viral antigens, only when appearing concomitantly with tumors, and histocompatibility antigens, only when directly related

to tumor incidence and development, are also within the scope of this Cancergram.

PB82-931100 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Cell Biology: Cell Kinetics.
Cancergram CB09.
1982, 12 issues
Supersedes PB81-931100.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

Within the purview of cell kinetics are all studies relating to the characterization and measurement of cell cycle parameters, particularly for in vivo studies of normal and tumor cells, and in vitro studies of derived cell lines. Methodologies for measuring the rates and timing of mitotic activity are highly relevant; however, investigations relating to associated metabolic intracellular events during the process of division are not in scope. Of related interest are the effects of oxogenous agents, both chemical and physical, on cell kinetics and any events or activities that are cell cycle-dependent or specific. Growth regulation related to endogenous factors is generally excluded, as it is covered by Cancergram CB16.

PB82-931300 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Cell Biology: Cytogenetics.
Cancergram CB12.
1982, 12 issues
Supersedes PB81-931300.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

All studies concerned with karyotype analysis, banding patterns and other microscope techniques for investigating chromosome number, identification and abnormalities are included. An overview of agents resulting in chromosomal or chromatid damage is essential to the scope of this Cancergram. All gene mapping studies which require cytogenetic analysis to establish the linkage groups for specific genes are included. Clinical studies associating chromosomal abnormalities with risk or presence of cancer are also in scope.

PB82-931800 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Immunobiology and Cancer: Identification and Characterization of Immune Cells.
Cancergram CB17.
1982, 12 issues
Supersedes PB81-931800.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram concerns markers used in characterization of cells associated with the immune system in normal and neoplastic states. These include surface antigens, surface immunoglobulins, specific immune receptors (Fc and complement), and rosetting phenomena, as well as other markers which specifically characterize leukocytes. Areas of interest include characterization of leukemia and lymphoma cells; studies of normal leukocyte markers; alterations of these markers after immune activation, neoplastic transformation and treatment with chemical or physical agents; and the detection and characterization of these markers in other normal and neoplastic cells. Tumor-associated and virus-related antigens are not in scope and are covered in Cancergrams CB05 and CB13, respectively.

PB82-932000 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Immunobiology and Cancer: Functional Aspects of Cellular Immunity.
Cancergram CB15.
1982, 12 issues
Supersedes PB81-932000.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram focuses on the mechanisms of cell mediated immunity (CMI) and the interaction between CMI and tumors. The scope centers on characterizing functions and methods for monitoring and evaluating CMI in vivo and in vitro, for humans and animal model systems. Related phenomena, such as macrophage-mediated and antibody-dependent cell-mediated cytotoxicity, are covered. Studies related to the functional aspects of the immune response include the role of CMI in tumor rejection, and endogenous factors, suppressor cells, and applied agents that modulate CMI. Structural aspects of the ellular components and identification of immune cell surface markers are generally not in the scope of this Cancergram, nor are papers relating primarily to the humoral (antibody-mediated) immune system. These subjects are covered in Cancergrams CB17 and CB08, respectively.

PB82-935200 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Environmental and Occupational Carcinogenesis.
Cancergram CK02.
1982, 12 issues
Supersedes PB81-935200.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The epidemiology-oriented Cancergram deals with broad aspects of the origin of source of cancer in the general population. The scope includes factors such as geographic region, ethnic origin, socioeconomic class, lifestyle, emotional health, and personal habits which may be implicated in the development of human cancer. The scope also includes selected articles on environmental pollution, occupation, medical treatment, public policy, and environmental screening tests that have significance for carcinogenesis in the general population. The Cancergram generally excludes articles relating only to narrow population groups, and specifically excludes dietary aspects of human carcinogenesis, which are covered in Cancergram series CK03.

PB82-935400 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Hormonal Carcinogenesis.
Cancergram CK05.
1982, 12 issues
Supersedes PB81-935400.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This cancergram deals with the role of hormones in the induction of cancer, including both endogenous hormones and biologically derived or synthetic compounds having hormonal or endocrine stimulating properties. Where related to carcinogenesis, the scope also includes endogenous substances (e.g., prostaglandins) or exogenous substances (e.g., nutrients) that interact with hormones. Abstracts included also concern endogenous hormonal states predisposing humans to development of cancer, or potentially of value in identifying humans at high or low risk. Selected articles on biological, biochemical, and physiological properties of the hormones that are relevant to their carcinogenic properties are included. Studies on viral-hormonal interactions are generally excluded. Basic cancer-related biology and biochemistry of steroid hormones are covered by Cancergram series CB07, and of non-steroid hormones by Cancergram series CB24.

SGAE-3097 PC **A02**/MF **A01**
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Vienna.
New Method for Radioactive Wires and Hairpins for the Interstitial Curietherapy of Malignant Carcinomas.
M. I. Michailov, S. A. Maikarov, A. A. Sachatschiev, M. D. Mouschmov, and D. K. Teherani. Feb 80, 9p
BL-300/80
In German.
U.S. Sales Only.

A new method was developed to produce radioactive wires and hairpins with linearly increasing specific activity from centre to the ends. The advantages offered by these wires and hairpins have been introduced with successful results into a series of new implantation methods for the interstitial curietherapy of malignant carcinomas. (Atomindex citation 12:581857)

6F. Environmental Biology

AD-A108 778/2 PC **A04**/MF **A01**
Fish and Wildlife Service, Oracle, AZ. Inst. for Raptor Studies.
Responses of Raptorial Birds to Low Level Military Jets and Sonic Booms,
David H. Ellis. Oct 81, 67p
Contract F33615-80-D-4001
Results of the 1980-1981 Joint U.S. Air Force-U.S. Fish and Wildlife Service Study.

The following is a summary of the possible negative effects of the study stimuli on nesting raptors: (1) direct interruption of behavior leading to exposure of eggs or young to inclement weather, (2) physiological stress of parents or young leading to reduced reproductive performance, (3) eyrie abandonment (immediate and long term), (4) accidental death of young prematurely fledging when startled, and (5) other short-term behavioral responses. The goals of this study were to determine which if any of the possible adverse responses described above were operative in the case of peregrines nesting in Arizona. The approach was to experiment first with surrogate species and thereby minimize the possibility of disrupting Peregrine Falcon breeding efforts. By using a broad range of surrogate species, we also hoped to determine if any of these species were hypersensitive. The objective in many of the experiments was to simulate a worst case situation (i.e., booms louder and oftener than would be expected and repeated passes with aircraft oftener and closer than would be expected even in extreme conditions in the wild). The rationable behind this approach was as follows: if severe behavioral response could not be generated in the worst case experiments, then we could logically conclude that responses to less intense stimuli would be less severe.

AD-A108 835/0 PC **A04**/MF **A01**
Heidelberg Coll., Tiffin, OH. Water Quality Lab.
The Concentrations and Transport of Pesticides in Northwestern Ohio Rivers-1981.
Final rept.,
David B. Baker, Kenneth A. Krieger, and Josephine V. Setzler. Nov 81, 57p Rept no. TR-20
Contract DACW49-81-C-0028

This publication reports that the pesticide concentrations observed in northwestern Ohio Streams was higher than those reported in other areas. Levels of pesticides were not toxic to fish and invertebrates but inhibitory to growth, photosynthesis and respiration of algae. This report is a compilation of data and information gathered on concentrations of herbicides and insecticides. (AUTHOR)

AD-A108 872/3 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Agronomy.
Microbial Degradation of Pesticides.
Final rept. Oct 77-Sep 81,
M. Alexander. 30 Nov 81, 18p Rept no. 1
Contract N00014-78-C-0044

The pathway of degradation of one organophosphorus insecticide, Dichlorvos, was studied in detail. A microbial enrichment containing principally two pseudomonads and a bacillus, when incubated in a salts solution containing a vitamin supplement and 250 microgram/milliliter Dichlorvos as sole carbon source, could partially degrade the insecticide. At the end of 7 days incubation, much of the parent molecule was still present but biologically formed metabolites were also noted by TLC, GLC, and mass spectral analyses. The presence of dichloroethanol was confirmed, and evidence was also obtained for the presence of 1,1-dichloroethyl acetate, suggesting a mechanism of cleavage whereby the dichlorovinyl leaving group of the molecule is cleaved from the parent molecule. Whether cleavage was chemical, biological or both was not determined. Inorganic phosphate was formed in increasing amounts in a 4-day incubation period, especially in treatments containing a second more utilizable carbon source, implying a cometabolic route for the degradation of Dichlorvos. Evidence for biological demethylation was also obtained. The results provide evidence for a microbial role in the transformation in conjunction with chemical hydrolysis of Dichlorvos. (Author)

AD-A108 938/2 PC **A02**/MF **A01**
Utah Univ., Salt Lake City. Dept. of Bioengineering.

Chemically Sensitive Field-Effect Transistor to Detect Organophosphorous Compounds and Pesticides.
Journal article 31 Jul-30 Sep 79,
Jiri Janata, Robert J. Huber, Richard Cohen, and Edward S. Kolesar, Jr. 1981, 8p SAM-TR-81-201
Contract F33615-78-D-0617
Pub. in Aviation, Space, and Environmental Medicine, v52 n11 p666-671 Nov 81. See also Rept. no SAM-TR-80-25, AD-A093 355.

No abstract available.

AD-A109 027/3 PC **A04**/MF **A01**
WAPORA, Inc., Earth City, MO.
Aquatic Biological Inventory, Hartwell Drainage and Levee District, Greene County, Illinois,
Richard N. Kubb. 7 Dec 81, 69p
Contract DACW43-81-M-2557

The primary objective of this study was to identify and provide a qualitative evaluation of the aquatic habitats associated with the Hartwell District. A secondary objective included quantification of key physical and biological parameters at specific sampling locations within the study area. These data were used to support statements regarding the quality of the aquatic habitats of the Hartwell District. (Author)

HRP-0903752/4 PC **A02**/MF **A01**
Health Systems Agency of New York City, Inc.
Primary Care: Environmental and Occupational Health Hazards Guide.
Mar 81, 20p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

A quick reference about the environment and work-relatedness of disease is provided in this guide. Its purpose is to alert the primary care practitioner to the role of environmental and occupational factors in the etiology of diseases and to aids in their diagnosis. Included in this booklet is an overview of the problem, a list of common signs and symptoms, a sample environmental and occupational history form that can be photocopied for inclusion in all patients' records, a table of selected toxic exposures and manifestations, agencies and organizations serving as resources, and recommended desk-top references on environmental and occupational medicine. Over the past ten-year period, numerous health problems have been traced to exposures to hazardous substances in the workplace, home, and community environments. Those diseases which have received widespread attention, such as lead poisoning and asbestosis, serve to illustrate the causal relationship between environmental and occupational exposure and human disease. Awareness and suspicion are the practitioner's best tools for tracking down environmentally and occupationally induced disease, and he/she should take an environmental and occupational history on each patient.

PB82-143256 PC **A02**/MF **A01**
Environmental Monitoring Systems Lab., Las Vegas, NV.
Atmospheric Benzene Depletion by Soil Microorganisms.
Journal article,
James C. McFarlane, Amy Cross, Clyde Frank, and Robert D. Rogers. Dec 81, 9p EPA-600/J-80-046
Pub. in Environmental Monitoring and Assessment 1, p75-81, 1981. Prepared in cooperation with Northrop Services, Inc., Las Vegas, NV; Iowa Univ., Iowa City, and Idaho National Engineering Lab., Idaho Falls.

Gaseous benzene was rapidly depleted in exposure chambers containing viable soils and plants. When separate components of the system were analyzed, no benzene was detected in soils, plants, or water. Soil microorganisms were shown to be responsible for metabolizing benzene, yielding CO2 as the main product. The rates were sufficiently rapid to suggest that this reaction forms a major pathway for the elimination of benzene from the environment.

PB82-143330 PC **A02**/MF **A01**
National Heart, Lung, and Blood Inst., Bethesda, MD.
The Sensitivity of the United States Environment to Acid Precipitation.
Journal article,
Norman R. Glass, Charles F. Powers, Jeffrey J. Lee, Danny L. Rambo, and David W. O'Guinn. 1980, 4p EPA-600/J-80-362
Pub. in Proceedings of the International Conference on Ecological Impact of Acid Precipitation, SNSF Project, Norway 1980. Prepared in cooperation with Northrop Services, Inc., Corvallis, OR.Color illustrations reproduced in black and white.

There is evidence of the spread of acid precipitation from the northeast to all the states east of the Mississippi River. In view of this a short-term assessment program was initiated by the Environmental Protection Agency in April 1979 to survey the scope of the acid rain problem in the United States. This survey was based primarily on existing information and to a lesser degree, on a series exposure experiments conducted at the EPA experimental farm in Corvallis, Oregon. The field studies examined the effects of acidity on field crops and certain forest processes. These short term findings will be useful in formulating a long-term research effort.

PB82-152919 PC **A03**/MF **A01**
National Enforcement Investigations Center, Denver, CO.
Pesticide Use Observations Monterey County, California, April 29-May 2, 1977,
Aug 77, 42p EPA-330/2-77-018

From April 29 to May 2, 1977 a pesticide use observation was conducted by the National Enforcement Investigations Center(NEIC) on a lettuce field in Monterey County, California. During the observation, an EPA study team evaluated the activities associated with the aerial application of Phosdrin to control an infestation of aphids. The use observation study in Monterey County revealed exemplary storage and handling procedures.

PB82-154840 PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Disinfection of Filtered and Unfiltered Secondary Effluent in Two Ozone Contactors.
Journal article,
A. D. Venosa, M. C. Meckes, E. J. Opatken, and J. W. Evans. 15 Jan 81, 14p EPA-600/J-80-374
Pub. in Environment International, v4 p299-311 1980.

The objective of this study was to evaluate the effect of filtration of secondary effluent on the mass transfer and disinfection efficiencies of two ozone contactors. The two contactors used in the comparison were a multicolumn bubble diffuser and a stirred tank reactor. The approach chosen was based on a type of statistical experimental design used in a previous contactor comparison. The design made it possible to compare the ozone transfer and coliform reduction efficiencies of the two contactors with respect to applied dose, while at the same time comparing filtered and unfiltered effluent. Results indicated that better mass transfer efficiency and, consequently, better coliform reduction efficiency occurred in the bubble diffuser, and the differences between contactors increased with dose. Mass transfer in both contactors was higher in unfiltered effluent than in filtered effluent. The most signficant factors affecting the fecal coliform numbers in the treated secondary effluent were total chemical oxygen demand (COD) and absorbed ozone dose. Regression equations were developed to predict final coliform numbers as a function of COD and absorbed ozone dose.

PB82-162587 PC **A02**/MF **A01**
Economics and Statistics Service, Washington, DC. Natural Resource Economics Div.
Biota Quality: A Riparian Habitat Model.
Staff rept.,
Eric B. Oswald. Jun 81, 19p AGESS-810611

This paper presents a model for defining and measuring biota quality for the purpose of assessing the impacts of resource development plans on biota quality. The model uses the habitat approach and concentrates on the riparian system. The means to measure the parts of a riparian system, weigh the importance of the various parts, and produce an overall index of biota quality are presented.

PB82-803990 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
DDT, DDD, and DDE Pesticides. 1977-1981 (Citations from the NTIS Data Base).
Jan 82, 210p
Supersedes PB80-815350, and NTIS/PS-79/1029. See also 1964-1976, NTIS/PS-78/0943.

The cited reports cover pollution, biodegradation, ecological effects, uses, and accumulation in plants and animals of DDD, DDE, and DDT insecticides. (This updated bibliography contains 203 citations, 22 of which are new entries to the previous edition.)

PB82-861949 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ecology: Systems Theory Applications. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 327p

This bibliography covers principles and techniques for, and results of, applications of systems theory to ecology. Ecological modeling and simulations of population behavior, characteristics, dynamics, control, and distributions (spatial and chronological) are considered. Ecological interdependencies and harvesting effects are considered as well. (Contains 360 citations fully indexed and includes a title list.)

6H. Food

AD-A109 349/1 Not available NTIS
Illinois Univ. at Urbana-Champaign. Dept. of Food Science.
Water Activity Determination with the Proximity Equilibration Cell,
T. D. McCune, K. W. Lang, and M. P. Steinberg. 1981, 3p ARO-15671.5-L
Grant DAAG29-78-G-0193
Availability: Pub. in Jnl. of Food Science, v46 n6 p1978-1979 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-153404 PC **A05**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
A Review of Folate Intake, Methodology, and Status.
Technical rept.,
Sue Ann Anderson, and John M. Talbot. Nov 81, 90p FDA/BF-82/13
Contract FDA-223-79-2275

There are numerous forms of the B complex vitamin, folacin, that have metabolic activity. Methods to differentiate among these forms and to measure total folate are reviewed. Analysis of folate content of foods has yielded variable results, thereby limiting direct estimates of folate intakes. Availability of food folates as estimated by disappearance data is about 225 micrograms/d for the United States population. Correlation of compromised folate status and low dietary intake of folate status in subgroups of the population has not been demonstrated. However, available data indicate that subgroups at risk of folate deficiency, as determined by biochemical analysis, include premature infants, adolescents, pregnant women, lactating or nonlactating women postpartum, alcoholics, and the elderly. While such data suggest compromised folate status, evidence from large surveys is insufficient to determine whether a problem of public health significance exists in the United States. Studies of folate fortification of foods are reviewed.

PB82-154402 PC **A04**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Nutrition Labeling for Today's Needs: Opinions of Nutritionists, the Food Industry, and Consumers,
James T. Heimbach, and Raymond C. Stokes. Dec 81, 52p

Five hundred and thirty-one members of the American Institute of Nutrition, 177 persons from the food industry, and 107 consumers from a Food and Drug Administration mailing list responded to a survey dealing with nutrition labeling of foods. They identified obesity and heart disease as the major diet-related national health problems and chose as most useful to the public information about calories, sodium, fat, protein, iron, calcium,and carbohydrates. Although industry respondents opposed the suggestion, the other respondents favored providing information about sugars,

starch, and fiber along with total carbohydrates. The current means of declaring micronutrient content, percent, of U.S. Recommended Daily Allowance per serving, was chosen as the best available method. Respondents were divided as to whether declarations should be made of substances not in the product and whether disease-related claims should be permitted on food labels. It was widely agreed that simplicity and ease of understanding should be the major goals of any revision of food labels.

PB82-155466 PC **A03**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Evaluation of the Health Aspects of Peptones as Food Ingredients.
1981, 30p SCOGS-II-17, FDA/BF-82/17
Contract FDA-223-78-2100

This report by a group of qualified scientists designated the Select Committee of GRAS Substances (SCOGS), provides an independent evaluation of the safety of the health aspects of peptones as food ingredients.

PB82-155474 PC **A02**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Evaluation of the Health Aspects of a Mixture of Diferrous, Dipotassium Ferrous, and Potassium Ferrocyanides as a Fining Agent in Wine Production.
1981, 23p SCOGS-II-10, FDA/BF-82/19
Contract FDA-223-78-2100

This report, by a group of qualified scientists designated the Select Committee of GRAS Substances (SCOGS), provides an independent evaluation of the safety of the health aspects of a mixture of diferrous, dipotassium ferrous, and potassium ferrocyanides as a fining agent in wine production.

PB82-155482 PC **A03**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Evaluation of the Health Aspects of Wheat Gluten, Corn Gluten, and Zein as Food Ingredients.
Final rept.
1981, 32p SCOGS-II-12, FDA/BF-82/18
Contract FDA-223-78-2100

This report, by a group of qualified scientists designated the Select Committee of GRAS Substances (SCOGS), provides an independent evaluation of the safety of the health aspects of wheat gluten, corn gluten, and zein as food ingredients.

PB82-861592 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Canned Food Microbiology. 1979-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1979-Feb 82.
Feb 82, 91p

This bibliography contains citations concerning the microbiology of canned foods. Sources of contamination (particularly Clostridia), factors affecting the growth of bacteria and methods for detecting and isolating contaminated canned foods are discussed. Optimum sterilizing temperatures and formulas for calculating the lethal value of the thermal process are discussed. Emphasis is on low-acid foods. (Contains 84 citations fully indexed and includes a title list.)

PB82-861600 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aflatoxin Contamination of Foods. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 170p

This bibliography contains citations concerning aflatoxin contamination of foods. The wide variety of foods contaminated by aflatoxins and the conditions for the growth of aflatoxin producing Aspergillus species are discussed. The carcinogenic potential is described and methods for detecting, separating, and quantitating the toxins are discussed. (Contains 157 citations fully indexed and includes a title list.)

PB82-935300 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Dietary Aspects of Carcinogenesis.
Cancergram CK03.
1982, 12 issues
Supersedes PB81-935300.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram deals with all aspects of the relationship of diet to occurrence of cancer in man. The scope includes natural carcinogens in foods or beverages, potential carcinogens introduced by contamination or processing, the role of essential nutrients in the development of cancer, studies on the nutritional aspects of the etiology of human cancer, and selected articles on screening methods and public policy that relate to diet and carcinogenesis. The scope includes both epidemiological studies and studies on the mechanisms by which carcinogens may arise in food or nutrients and may affect the development of cancer. The Cancergram generally excludes purely agent-oriented articles, and specifically excludes articles not related to diet or food.

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PB82-142936 PC **A04**/MF **A01**
Kaiser Foundation International, Oakland, CA.
Development and Validation of a Method to Determine the Cost/Benefit Effectiveness of Occupational Health Programs (Technical Supplement to the Final Report).
Aug 74, 74p
Contract PHS-NIOSH-099-73-0053

A generic model for the analysis of costs and benefits of occupational health programs is developed, and data from Kaiser Steel Corporation's Fontana Works used to test the validity of the model. A cost accounting system is developed for the medical facility which permits categorizing all of the costs for the resources for the facility on an annual basis. The actual dollar and nondollar, or intangible, benefits and their effectiveness are difficult to determine because the model needs more precise data. An employee attitude survey, planned to help identify some of the intangible benefits is not implemented because labor negotiations are incomplete.

PB82-150186 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Hazard Evaluations and Technical Assistance Branch.
Technical Assistance Report No. 80-092-769 at Rutgers University, Newark, New Jersey,
R. A. Costello, A. Lucas, and J. Melius. Nov 80, 13p
TA-80-092-769

Bulk samples of ceiling tiles were collected on July 3, 1980, to determine the presence of asbestos (1332214), and industrial hygiene and engineering data was evaluated at Smith Hall, Rutgers University (SIC-8221), Newark, N.J. The evaluation was requested by the State of New Jersey, Department of Health to determine whether diseases reported among faculty and staff at Smith Hall could be traced to environmental factors within the building. Potential exposures caused by leakages, containing animal urine and excrement contaminated with estrogens, enzymes and radioisotopes, were suspected of causing cancer and breast and ovarian cysts among the faculty and staff. Samples of ceiling tiles contained no asbestos. Data provided by the university indicated that samples of Rozol and air samples of asbestos, toluene (108883), benzene (71432), xylene (1330207), trichloroethylene (79016), methylenechloride (75092), pentane (10960) and hexane (110543) were within OSHA standards. Concentrations of chloroform (67663) ranged from below detection limits to 80 parts per million (ppm) and exceeded the OSHA standard of 50ppm. Samples taken from the third and fourth floors indicated the presence of bacteria. Strong animal odor was noted from the animal area exhaust vents. Faculty and staff complained about ventilation. Plumbing problems resulted in the soiling of ceilings with water possibly containing monkey excrement. Evidence of water damage and flooding was observed. The authors conclude that there is no evidence of environmental overexposure. However, there are deficiencies in the plumbing, mechanical ventilation systems, work practices and animal handling procedures. The authors recommend that water leakage be prevented, the ventilation system be tested and modified to suit the needs, and animal care practices be modified to meet hygienic standards.

PB82-150210 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Surveillance, Hazard Evaluations and Field Studies.
Health Hazard Evaluation Report No. HHE-78-44-715 at Kaiser Aluminum and Chemical Corporation, Ravenswood, West Virginia,
K. J. Kronoveter. Nov 80, 29p HHE-78-44-715

Personal and area air samples were collected, workers were given a medical questionnaire and ventilation was assessed at Kaiser Aluminum and Chemical Corporation (SIC-5051) in Ravenswood, West Virginia, from July 18 to 20, 1978 and April 3 to 5 and June 11 to 14, 1979. The evaluation was requested by a union safety and health committeeman of United Steelworkers of America, Local 5668, on behalf of an unspecified number of workers. Concentrations of coal tar pitch volatiles (CTPVs) ranged from nondetectable to 0.14 milligrams per cubic meter (mg/cu m) in April 1979. Concentrations of benzo(a)pyrene (50328), chrysene (218019), pyrene (129000), benzo(a)anthracene (56553), and fluoranthene (206440) ranged from nondetectable to 3.80, 4.90, 32.90, 28.0 and 48.0 micrograms/cu m, respectively. Total particulates and fluorides ranged from 0.3 to 177 and 0.07 to 2.47mg/cu m, respectively. Concentrations of sulfur-dioxide and carbon-monoxide ranged from undetectable to over 25 and 15 parts per million (ppm), respectively. Hydrogen-fluoride was not detected. In bulk samples of anodes and cathodes, concentrations of benzo(a)pyrene, chrysene, pyrene, benzo(a)anthracene and fluoranthene ranged from less than 4.9 to 4280, 11.3 to 1960, 39.5 to 5730, 9.0 to 4840, and 6.8 to 5530 micrograms per gram, respectively. Benzene solubles ranged from less than 3.6 to 90.9 milligrams per gram. OSHA standards for CTPVs, total particulate, fluorides, sulfur-dioxide and carbon-monoxide were 0.2mg/cu m, 15mg/cu m, 2.5mg/cu m, 5ppm and 50ppm, respectively. The author concludes that potentially hazardous exposures to CTPVs, total particulates and sulfur-dioxide exist for potroom workers. The author recommends improved housekeeping and ventilation and the use of respiratory protection.

PB82-150277 PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report, Grove Manufacturing Company, a Division of Walter Kidde and Co., Inc., Shady Grove, Pennsylvania 17256,
Marshal S. Levine, and George S. Reichenbach. 6 Nov 79, 24p IWS-74.64
Contract PHS-NIOSH-210-77-0096
Portions of this document are not fully legible.

Worker exposures to airborne contaminants from paint were examined at Grove Manufacturing Company (SIC-3531) in Shady Grove, Pennsylvania, on January 18, 1979. The company was under consideration for inclusion in an in-depth NIOSH survey of health hazards to painters. Approximately 42 of the 3000 employees were painters. There was no formal industrial hygiene program. There was a medical department staffed by four nurses and one physician. There was a medical and safety program and personal protective equipment was required depending on job requirements and location. Personnel records contained personal, salary, and employment history data. A preplacement physical examination was required and medical records of daily logs for sick call and physician's notes were kept. An airflow system was installed in the paint booths. The authors conclude that the company would be suitable for an industrial engineering study, but due to the small number of painters, the high turnover rate, and records, the workforce is not suitable for further study. They recommend that this facility be considered for inclusion in an in-depth study.

PB82-150285 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Pilot Industrial Hygiene Assessment of Swine Confinement Operations,
Terry Thedell. 11 Oct 79, 38p

Occupational hazards associated with swine confinement operations are reviewed. Concepts and basic practices used throughout the industry are discussed. The hazards of high concentrations of pit gases composed of methane, hydrogen-sulfide, ammonia, and carbon-dioxide are described, along with hazards related to dust and pathogenic organisms. NIOSH walk-through surveys in confinement operations in Iowa, Illinois, Colorado, and Missouri during fiscal year (FY) 1979 are discussed and planned studies for FY 1980 are presented. An appendix is included which describes sampling techniques for bacteria and organisms in air and dust, as well as endotoxin analysis.

PB82-150293 PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report of John Deere Harvester Works, East Moline, Illinois 61244,
Genevieve M. Matanoski, Charles E. Billings, and Newton E. Whitman. 25 Jul 79, 20p IWS-74.21
Contract PHS-NIOSH-210-77-0096

Health hazards to workers in painting operations were surveyed at John Deere Harvester Works (SIC-3523) in Moline, Illinois, on October 11, 1978. The company was under consideration for inclusion in a NIOSH investigation of health hazards in the painting trades. About 250 employees were exposed to the spray paint operations. The company had a formal industrial hygiene and safety program, a safety director, and a manager of industrial hygiene. The company employed three full-time and one part-time physician, and four nurses. Personnel records included demographic information, job assignments, and personal information. Medical records were kept for each absence. A respirator training program and a blood lead monitoring program were maintained. While ventilation was satisfactory in most areas, there were some areas where tempered air was not provided. The authors conclude that the facility seems suitable for inclusion in the NIOSH survey. They recommend checking the ventilation in the winter when the building is closed.

PB82-150301 PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report of Whitehead and Kales, River Rouge, Michigan,
Genevieve M. Matanoski, Marshal S. Levine, Charles E. Billings, and Donald Schott. 20 Nov 79, 15p IWS-74.19
Contract PHS-NIOSH-210-77-009 6

Health hazards to workers in painting operations were determined at Whitehead and Kales (SIC-3743) in River Rouge, Michigan, from September 25 to 26, 1978. The company was under consideration for inclusion in a NIOSH in-depth epidemiological, industrial hygiene, and medical study of health hazards in the painting trades. Approximately 60 of the employees were painters, and some of the workers in other job classifications were also possibly exposed. The company had no formal industrial hygiene program. The company employed two nurses and provided blood lead examinations two times per year on painters. There was a local rescue squad and about 30 employees on each shift were trained in first-aid. Personnel records provided personal, demographic, and payroll information and a separate file for health insurance and workman's compensation claims was kept. The paint spray booth and spray yard were so large and widely spaced that paint vapor concentrations were low. The authors recommend that this company not be included in the NIOSH survey, but they note that the medical records available and the blood lead data would make the company ideal for studying the relationship between painting and lead exposure.

PB82-150780 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
The Federal Mine Health Program in 1979: Health Activities Under the Federal Mine Safety and Health Act.
Annual rept.
Aug 80, 19p DHHS/PUB/NIOSH-80-150

Under the provisions of the Federal Coal Mine Health and Safety Act of 1969, as amended by the Federal Mine Safety and Health Act of 1977, the National Institute for Occupational Safety and Health (NIOSH) is responsible for conducting research to protect the health and safety of America's workers in coal, metal and nonmetal mines. NIOSH recognizes the need to provide more effective means and measures for improving the working conditions and practices in the nation's mines in order to prevent occupationally related injuries, diseases and deaths. The Institute's research in Fiscal Year 1979 (FY 79) furthered efforts to achieve this goal.

PB82-150798 PC **E03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Occupational Characteristics of Disabled Workers.
Jul 80, 47p DHHS/PUB/NIOSH-80-145
Sponsored in part by Social Security Administration, Baltimore, MD.

Occupational characteristics of disabled workers were analyzed based on Social Security disability benefit awards during 1969 to 1972. Race and sex specific and age adjusted proportional morbidity ratios were determined based on disabling condition and occupation, and numbers of disable workers were estimated by disabling condition occupation, age, sex and race to furnish a reference for epidemiological investigations of occupational morbidity. The Continuous Disability History Sample file was used as a data source. The authors note that during 1969 to 1972 period, 73 percent of the estimated 1.5 million disabled workers awarded Social Security disability benefits were men. Eighty five percent of the beneficiaries were White, 14 percent were Black, and about 1 percent were of other races. Circulatory and musculoskeletal system disabilities comprised 31.5 and 15.4 percent of the total, respectively. Mental disorders ranked third in all subgroups, except White women, for whom neoplasms ranked slightly ahead of mental disorders. Service occupations; structural work; clerical and sales; professional, technical, and managerial; and machine trade occupations comprised 15.9, 13.3, 13.2, 10.6, and 9.0 percent of the disability groups, respectively.

PB82-150814 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. 79-075-784 at St. Clair Rubber Company, Marysville, Michigan,
S. A. Salisbury. Dec 80, 27p HHE-79-075-784

Personal and area environmental samples were analyzed for the presence of carbon-black (1333864), lead (7439921), and antimony (7440360) and total particulates in the compounding area and mill room at the St. Clair Rubber Company (SIC-3069) in Marysville, Michigan, from May 14 to 16, and November 19 and 20 1979. The evaluation was requested by a vice president of the company. The factory employed about 160 workers. Ten to 16 workers were assigned to the compounding area where raw materials were batched, mixed, milled, and calendared. Total dust particulates ranged from 0.03 to 6.9 milligrams per cubic meter (mg/cu m), one lead sample was 9.7 micrograms per cubic meter as an 8-hour time weighted average (TWA), antimony concentrations ranged from 0.01 to 0.15mg/cu m and carbon-black concentrations ranged from 0.11 to 2.59mg/cu m. Dust particulates, lead, antimony and carbon-black OSHA criteria standards were 10mg/cu m, 30 micrograms/cu m meter for an 8-hour (TWA), 0.5mg/cu m and 3.5mg/cu m for an 8 hour TWA, respectively. The author concludes that there were no hazardous exposures to dust containing carbon-black, lead or antimony under existing conditions. He recommends that work practices be closely monitored to minimize exposure to lead and antimony and that their suggestions for further reducing exposures be implemented.

PB82-150830 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Industrial Hygiene Section.
Industrial Hygiene Report In-Depth Survey, Solvent Vapor Survey of Screen Printing Operations at Larstan Processing Company, Inc., Maspeth, New York 11378.
Industrywide study,
Peter Vongrungsemon. 21 Nov 80, 16p IWS-77.15

Worker exposures to solvents were determined at Larstan Processing Company (SIC-2751) in Maspeth, New York, on November 13, 14, and 18, 1978. The company was part of a NIOSH study of industrial hygiene in the screen printing industry. Of 37 employees, 27 worked in the production area. Solvent concentrations in the personal areas and general shop were well below OSHA standards. Higher concentrations were found during screen cleaning than in other areas. The author concludes that workers in all areas are exposed to low concentrations of many solvents. He recommends better work habits, and a general awareness of the influential factors of safety, efficiency, and worker comfort.

PB82-150855 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. 80-057-781 at Long Island Railroad, Richmond Hill, New York,
Richard Hartle. Dec 80, 21p HHE-80-057-781

Environmental and personal air samples collected from the armature room, battery shop, and paint shop were analyzed for dusts, fumes and chemical pollutants at the Long Island Railroad (SIC-4020) Richmond Hill facility, New York, from June 2 to 5, 1980. The evaluation was requested by an authorized representative of the International Brotherhood of Electrical Workers, Local 589, on behalf of 800 hourly and 40 administrative workers. Breathing zone and general area samples were analyzed for particulates, asbestos (1332214), and metal dusts and fumes, vinyl-toluene (25013154), maleic-anhydride (108316), sulfuric-acid (7664939) mist, arsine (7784421), stibine (7803523), methyl-chloride (74873), isopropanol (67630), methanol (67561), methyl-ethyl-ketone (591786), heptane (142825), 1-nitropropane (108032), 2-nitropropane (79469), xylene (1330207), toluene (108883), butanol (71363), methyl-ethyl-ketone (78933), cellosolve-acetate (111159), butyl-acetate (123864), hexamethylene-diisocyanate (822060), and freon (75456). Analysis of breathing zone and general area samples indicated that all concentrations were well within the limits of the federal evaluation criteria, except for one sample of a nuisance particulate. The sample contained 16.1 milligrams per kilogram (mg/kg) of particulate, which exceeded the OSHA standard of 5mg/kg. Two samples of methylene-chloride were measured at 115.3 and 187.2ppm, exceeding the NIOSH standard of 75ppm. Five samples of hexamethylene-diisocyanate ranged from 0.027 to 0.054ppm, exceeding the NIOSH standard of 0.005ppm. The author concludes that a potential hazard exists from overexposure to nuisance particulates, methylene-chloride and hexamethylene-diisocyanate. He recommends improved exhaust ventilation and provision of respiratory protection to employees.

PB82-150947 PC **A03**/MF **A01**
PEDCo-Environmental, Inc., Cincinnati, OH.
Industrial Hygiene Walk-through Survey Report of Monsanto Commercial Products Co., St. Peters, Missouri 63376,
Robert D. Willson. 12 Oct 78, 40p IWS-68.23A

Worker exposure to X-ray radiation and arsenic (7440382) were surveyed at Monsanto Commercial Products Company (SIC-2833) in St. Peters, Missouri, on September 1, 1978. The survey was part of a study of developing energy technologies. The total number of employees was about 1,200, of whom 800 were in the production area. The company had safety, industrial hygiene, and medical programs, and a safety and health supervisor. An industrial hygienist was employed at the factory and the corporate headquarters by the insurance carrier. There was also a safety director and a part time doctor was on call. Pre-employment and periodic medical examinations were conducted. Automated personnel records and payroll records were available. Employees exposed to X-rays wore thermoluminescent dosimeter rings. The average annual exposure to X-rays was 17 millirems (mrem), which was below the permissible limits of 75,000mrem. Beam and scattered alpha radiation was consistent with background levels. Concentrations of respirable dust were less than 0.1 milligrams per cubic meter. Arsenic concentration was 1.7 micrograms per cubic meter. Dust samples were below 0.1 microgram per cubic meter of total dust. The author concludes that the health and safety program was good but deficient in experience and audit functions, and they recommend that additional arsenic exposure through skin contact, workplace air and ambient air be evaluated.

PB82-150954 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Industrial Hygiene Section.
In-Depth Industrial Hygiene Survey Report on Styrene Exposure at Tollycraft, Kelso, Washington.
Industrywide study,
Michael S. Crandall. 14 May 79, 49p IWS-78.21

Worker exposures to styrene (100425) and acetone (67641) were determined at Tollycraft (SIC-3079) in Kelso, Washington, from June 12 to 16, 1978. The

survey was part of a NIOSH study of the health effects of occupational styrene and acetone exposure. Approximately 140 of the employees at this facility were assigned to the production areas that were surveyed. The company had no formal industrial hygiene program, although it did maintain a safety program. Medical services were furnished by local medical facilities and employees trained in first-aid. None of the 53 samples for airborne styrene and acetone exceeded the OSHA standards of 100 and 1,000 parts per million (ppm), respectively. Eight hour styrene exposures ranged from 7.3 to 84.7ppm. Acetone concentrations ranged from 8.2 to 396ppm.

PB82-150988 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Hazard Evaluations and Technical Assistance Branch.
Hazard Evaluations and Technical Assistance Report No. TA-79-15 at Dulles International Airport, Washington National Airport, Washington, DC.
Apr 79, 40p TA-79-15

Exposure to asbestos (1332214) fibers at Dulles International Airport (SIC-4582) and at Washington National Airport were measured from January 15 to 17, 1979. The survey was requested by the Federal Air Surgeon. Bulk samples of ceiling material, floor sweeping and direct insulation were analyzed for presence of asbestos fibers. Twenty five general area air samples were taken at Dulles Airport and 12 at Washington National Airport. The ceiling material at Dulles contained 40 to 50 percent chrysotile (12001295) asbestos. Material at National contained 1 to 2 percent chrysotile-asbestos. No asbestos fibers in bulk samples of sweepings and no detectable concentrations of airborne asbestos fibers were found at either Dulles or National. One ventilation duct contained 40 percent chrysotile amosite (12172735) asbestos. The authors conclude there is no health hazard from exposure to asbestos fibers at either airport. They recommend monitoring air and dust at Dulles and dust at National to detect future deterioration of the ceilings. The asbestos containing duct wrappig should be covered and consideration be given to replacement.

PB82-151036 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Field Studies and Clinical Investigations.
U.S.P.H.S. Survey at Philip-Carey, Cincinnati, Ohio.
Industrywide study.
Jan 72, 10p IWS-32.30B

Personal air samples were analyzed at Philip-Carey (SIC-2661) in Cincinnati, Ohio, in June, 1971. Operations monitored included warehousing, mixing, forming, finishing, packing and miscellaneous operations for asbestos cement products. Millboard and gasket operations included mixing, forming, finishing and packing. Concentrations of fibers longer than 5 microns per milliliter ranged from 0.1 to 17.6 fibers.

PB82-151077 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Survey of Burlington Industries, Inc., Burlington House Finishing Plant, Form Fabrics Plant, Durham Domestics Plant, Brookneal Finishing Plant.
Industrywide study,
Troy Marceleno. Dec 74, 25p IWS-33.18

Worker exposures to textile processing chemicals, particularly bis-chloromethyl ether (542881) (BCME), were evaluated at the Burlington, Greensboro, Durham, and Brookneal facilities of Burlington Industries, Inc., (SIC-2221) from November 6 to 8 and December 3 to 4, 1974. Eighty five area and personal samples were collected from the 4 facilities during the first survey and 31 additional samples were collected from the Burlington and Durham facilities for independent analysis. Approximately 2,710 persons were employed by these facilities. Medical provisions included full-time nurses, trained first-aid personnel, preemployment physical examinations, and some spirometric and blood tests. An industrial hygienist and two part-time chemists periodically conducted hygiene surveys. The facilities were properly ventilated and had a slight negative pressure as a result of heat and moisture removal from the finishing rooms. Six samples taken during the initial survey were positive for BCME and two were below the level of detection (LOD). The samples were taken from the starch room, padding area, roof stack, and tenter entries. The follow-up samples from the Durham and Burlington facilities were below the LOD or contained only minimal amounts of BCME. The author concludes that BCME is present in area and personal samples from the textile finishing areas. He recommends that a substitute catalyst and resins free of formaldehyde be used in processing textiles, sputum examinations be conducted for employees working in high risk areas, intake and outtake ventilation be widely separated, and hygienic practices be upgraded.

PB82-151101 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. 79-88-768 at U.S Steel Tubing Specialists Center, Gary, Indiana,
Paul Johnson, and James Melius. Nov 80, 27p HHE-79-88-768

Environmental samples were analyzed for the presence of chromium (7440473), hexavalent chromium, iron-oxide (1332372), particulate fluoride manganese (7439965), lead (7439921) welding fumes, gaseous fluorides, nickel (7440020), molybdenum (7439987), and carbon-dioxide (124389) at the U.S. Steel Tubing Specialities Center (SIC-3312) in Gary, Indiana, on May 23 and 24, and September, 1979, and on January 30 and February 1, 1980. The evaluation request was by the United Steelworkers of America, Local 2697 on behalf of 34 welders to evaluate a high rate of cardiovascular disease among workers. Concentrations of total chromium, hexavalent chromium and particulate fluoride were 0.02, 0.006, and 0.003 milligrams per cubic meter (mg/cu m), respectively; and their corresponding OSHA permissible exposure concentrations were 1.0, 1.0 and 2.5mg/cu m. Concentrations of iron-oxide, manganese, lead, and welding fumes ranged from 0.1 to 2.9, 0.004 to 0.19, 0.01 to 0.57 and 0.59 to 9.6mg/cu m, respectively, and their corresponding OSHA permissible exposure concentrations were 10.0, 5.0, 0.05, and 5.0mg/cu m. Gaseous fluorides, nickel, molybdenum and vanadium were not detected. Concentrations of carbon monoxide ranged from less than 2 to 73.8 parts per million (ppm), exceeding the OSHA standard of 50ppm. The medical survey indicated an excess incidence of cardiovascular disease and increased respiratory symptoms. Blood lead and free erythrocyte protoporphyria results were normal. The authors conclude that a health hazard due to overexposure to lead, carbon-monoxide and welding fumes and an excess of cardiovascular disease and respiratory symptoms exists. They recommend measures for the protection of workers and the reduction of hazards.

PB82-151226 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Walk-through Industrial Hygiene Survey, Pine Hall Brick and Pipe Co., Madison, North Carolina 27025.
Industrywide study,
Harry M. Donaldson, and Frances Wolf. 12 Aug 75, 5p IWS-30.17A

The Pine Hall Brick and Pipe Company (SIC-3255) in Madison, North Carolina, was surveyed on August 12, 1975, prior to an in-depth survey of workers health and safety in the brick industry. The factory consisted of two operative areas; one was built in 1954 and used primarily manpower, the other was built in 1970 and was almost fully automated. There was no medical or safety program at the factory. The authors note that the factory offers a comparison of the old and new methods of brick making. They conclude that dust control can be achieved through automation.

PB82-151333 PC **A04**/MF **A01**
MSA Research Corp., Evans City, PA.
The Development of High Expansion Foam Systems for the Suppression of Respirable Coal Dust.
Final rept.,
Joseph V. Friel, Herbert E. Hays, and Ralph H. Hiltz. 15 Aug 73, 55p MSAR-73-82
Contract PHS-HSM-99-71-14

The current practice of mining coal underground with continuous mining machines provides levels of coal dust in the immediate area beyond the limits deemed safe for continuing exposure of the operating personnel. Effective control of the respirable portion of the dust has not been possible with the current methods of allaying the dust. The present practice depends on water sprays to minimize the amount of dust generated and face ventilation to remove that which does become airborne. Solutions, therefore, are required which can be applied to the current operations. A number of solutions have been proposed to accomplish this result on existing machinery. Among these, and one with considerable merit, is the use of high expansion foam to blanket the cutting operation, preventing the release of dust into the air. This is not a new system. In almost every instance where foam application was such that the dust was not allowed to become airborne, significant reductions in dust concentrations were noted. In each case, however, there were drawbacks to prevent the use of foam for dust suppression, not the least of which were the economics involved. The failure of detergent foams to achieve practical results in these tests should in no way reflect on its ultimate ability as a method of dust control.

PB82-151630 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Industrial Hygiene Survey Report in Support of Epidemiologic Study of RF Heat Sealer Operators at National Blank Book Company, Inc., Holyoke, Massachusetts.
Industrywide study,
Clinton Cox, and David Conover. 17 Feb 81, 39p IWS-88.25B

Exposure to hydrocarbons and radiofrequency (RF) radiation was measured at the National Blank Book Company (SIC-2648) in Holyoke, MA. on February 11 to 13, 1980. Heat sealer operators exposed to RF radiation were evaluated, and their general exposures were determined to identify a control group for a cohort study of reproductive effects of RF radiation on exposed female workers, and to determine worker exposure to other agents. Forty of the 50 operators who worked in the heat sealing area during three shifts were white females. Eighteen of the 24 heat sealers were located in a grounded wire mesh enclosed room. The other were in various other departments. Heat sealer operators were exposed to geometric mean electric and magnetic field strengths of 64.1 (V/m) volts per meter and 0.03 amperes per meter (A/m), respectively. Thirteen of the 30 operators were exposed in excess of the current OSHA standard of 10 milliwatts per square centimeter. General concentrations of nine hydrocarbons ranged from 6 to 17 parts per million (ppm). Operators were exposed to hydrocarbons in the screen print area ranging from 14.6 to 101.4 percent of the composite standard. The authors recommend selecting the female study cohort and the control group from various departments and job titles. RF radiation levels for all operators should be reduced to below 0.5 A/m for magnetic field strength and below 200 V/m for electric field strength and, if possible, further reduced below the NIOSH proposed standards of 0.164 A/m and 61.4 V/m. Chemical exposure in the screen print area should be reduced to within safe limits by covering all containers, storing unused chemicals at a central location, minimizing skin contact, and installing local exhaust ventilation.

PB82-151648 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report at Union Tank Car Company, Whiting, Indiana 46394,
Charles E. Billings, and Heather Stockwell. 16 Nov 79, 27p IWS-74.20
Contract PHS-NIOSH-210-77-0096

Worker exposures to paint materials were studied at the Union Tank Car Company (SIC-3743) in Whiting, Indiana, on February 6, 1979. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. Approximately 21 of the employees at the facility were assigned to the painting operations that were surveyed. The company had a safety and industrial hygiene program. Medical services were furnished by a local clinic and employees trained in first-aid. Personnel records provided demographic information, department assignments, and absence reports. Exterior tank painting was performed in a Bink water wash spray booth which provided downflow air from the top and sides. Ventilation volume appeared to be low. Respirators were used by painters for interior tank painting. The authors conclude that this workforce is probably not appropriate for the painting hazard survey due to the planned closing of the facility. However, they recommend that the new facility be considered for inclusion in the survey.

PB82-151671 PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.

Walk-through Survey Report at Bay Shipbuilding Corporation, a Subsidiary of the Manitowoc Co., Inc., 605 N. 3rd Avenue, Sturgeon Bay, Wisconsin 54235,
Marshal S. Levine, and Don Schott. 12 Jul 79, 21p IWS-74.47
Contract PHS-NIOSH-210-77-0096

Worker exposures to paint materials were studied at Bay Shipbuilding Corporation (SIC-3731) in Sturgeon Bay, Wisconsin, on December 13, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. Approximately 80 of the employees at the facility were assigned to the painting operations that were surveyed. The company had a safety and industrial hygiene program. Medical services were furnished by one part-time physician and five nurses. Personnel records provided demographic information, and seniority rankings. Exposure engineering controls were minimal because most painting operations were performed outdoors. Chlorinated rubber primer, alkyd primer, chlorinated rubber enamel, and alkyd enamel comprised the painting materials used at this facility. The authors conclude that this workforce merits consideration for inclusion in proposed NIOSH surveys due to the large amounts of paint used and the availability of medical records.

PB82-151739 PC **A05**/MF **A01**
Management Sciences Co., San Pedro, CA.
Supervisory Effects on Worker Safety in the Roofing Industry: Supplement, Complete Analysis of Data.
Contract rept.,
Robert A. Crisera, John P. Martin, and Kirk L. Prather. Dec 77, 81p NIOSH-00081010
Contract PHS-CDC-99-74-35

In the second of two studies by NIOSH for the purpose of investigating safety and accident causation in the roofing segment of the construction industry, an effort was made to identify, evaluate and compare characteristics of behavior, attitude, personality, knowledge, and supervisory style of a sample of 88 roofing foremen drawn from 30 roofing companies from different regions of the United States. The 30 companies included in the study were selected to represent the extremes of the accident frequency distribution in the industry. The results of the first study led to the conclusion that accident proneness does not exist as a stable and enduring trait of personality. That conclusion, together with observations regarding the unusually significant role of the foreman in roofing work, was a major stimulus to the present investigation. The study assessed the impact of the first line supervisor on the accident experience of roofing crews. Also assessed was the top management attitude toward roofer safety and commitment to roofer safety in relation to the first line supervisor and the accident experience of the company as a whole. The investigation was undertaken in five steps, and the approach to and accomplishment of these tasks are described in detail. A primary objective was the delineation of differences between foremen and top management of high and low accident experience companies. The hazards of roofing work are discussed and the relevant literature is reviewed. The unique role of the foreman and the problems and difficulties of research in the roofing industry are analyzed.

PB82-151747 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Industrial Hygiene Report Survey for N-Nitroso Compounds at Blue Side Tannery, St. Joseph, Missouri.
Industrywide study,
David P. Rounbehler, John Fajen, John Reisch, and Jim Coombs. 31 Oct 79, 20p IWS-72.33

Worker exposures to N-nitroso compounds were determined at the Blue Side Tannery (SIC-3111) in St. Joseph, Missouri, on January 16, 1979. The survey was part of an NIOSH study of worker's exposure to N-nitroso compounds in various industrial settings. The company employed about 134 workers. Twenty one air samples and eight bulk samples were collected and analyzed for N-nitroso compounds and their precursors. N-nitrosodimethylamine (62759) (NDMA) was present in all interior air samples, and ranged from 0.2 to 2.1 micrograms per cubic meter. None of the process water bulk samples contained measurable amounts of NDMA, although 1.4 to 2.5 micrograms per milliliter of NDMA were found after nitrosation of three of the eight samples. All of the morpholine spiked thermosorb tubes contained N-nitrosomorpholine (59892), indicating the presence of a nitrosating agent in the air.

PB82-151754 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report at the Boeing Company Plant 2, Box 3707, 7755 East Marginal Way So., Seattle, Washington 98124,
Genevieve M. Matanoski, Charles E. Billings, Heather Stockwell, and Peter S. J. Lees. 26 Oct 79, 41p IWS-74.17
Contract PHS-NIOSH-210-77-0096

Worker exposures to paint materials were studied at the Boeing Company (SIC-5088) in Seattle, Washington, from August 23 to 24, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. The number of employees assigned to the painting operations at this facility was not specified. Medical services were furnished by 17 physicians, 8 of whom were employed on a part-time basis, operating from four major company clinics. Personnel records provided demographic information, department assignments, and absence reports. The company had a safety and industrial health program. Most exposure engineering controls appeared satisfactory and painters had access to respiratory protective devices and personal protective equipment. The authors conclude that this workforce merits considerations for inclusion in the painting hazards survey because of the availability of in depth personnel records.

PB82-151762 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report at Hamilton Industries, 1316 Eighteenth Street, Two Rivers, Wisconsin,
Marshal S. Levine, and Newton E. Whitmen. 17 Oct 79, 42p IWS-74.50
Contract PHS-NIOSH-210-77-0096

Worker exposures to paints and solvents were surveyed at Hamilton Industries (SIC-2522) in Two Rivers, Wisconsin, on February 6 1979. The company was under consideration for inclusion in a NIOSH study of health hazards in the painting industry. Approximately 90 to 100 of the employees at the facility were assigned to the painting operations. The company maintained a formal safety and industrial hygiene program. Personnel records provided demographic information and absence reports. Approximately 15,000 gallons of unreduced paints were used by this facility every month. Solvents used in painting operations included methyl-ethyl-ketone (78933), proprietary ethyl-alcohol (64175), butyl-cellosolve (111762), aromatic-petroleum solvent, acetone (67641), methyl-alcohol (67561), wood-alcohol (67561), normal butyl-alcohol (71363), and butanol-xylene. Paints used included acrylic and alkyd types. The authors conclude that the facility would not be suitable for an industrial hygiene survey, since a major portion of the work process is scheduled for redesign, however, the workforce could be used in an in-depth epidemiological study.

PB82-151770 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
In-Depth Industrial Hygiene Survey Report on Styrene Exposures at Chrysler Boat Corporation, Plano, Texas.
Industrywide study,
Michael S. Crandall. Oct 79, 43p IWS-78.27

Worker exposures to styrene (100425) were determined at Chrysler Boat Corporation (SIC-3079) in Plano, Texas, from January 30 to February 1979. The survey was undertaken as part of a NIOSH study of the health effects of occupational styrene exposure. Approximately 56 of the workers at this facility were assigned to the resin laminating operations that were surveyed. Charcoal tube personal samples from styrene ranged from 29.5 to 158 parts per million (ppm), with a mean of 90.1 ppm; the OSHA standard is 100ppm. Personal acetone (67641) samples ranged from 16.5 to 351ppm, well below the OSHA standard of 1000ppm. The author recommends improvements in exhaust ventilation and proper use of respirators to reduce worker exposures to styrene.

PB82-151788 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
New Mexico Highway Department Crusher Study.
Industrywide study.
Aug 71, 5p IWS-30.25

Data from a New Mexico Highway Department Crusher study from August 23 to 26, 1971 are presented. The author notes that concentrations of respirable dust at a Bernalillo, La Bajada, and Solano crusher location ranged from 340.0 to 0.26 milligrams per cubic meter. Silicon-dioxide (7631869) (SiO_2) concentrations ranged from 3.3 to 55.5 percent. Settled dust ranged from 6.4 percent at Solano to 55.5 percent at Bernalillo. Area dust samples ranged from 19.2 percent at LaBajada to greater than 40 percent at Bernalillo. Personnel samples ranged from 3.3 percent at Solano to 54.7 percent at Bernalillo. Threshold limit values ranged from 0.18 at several locations to 1.89 at one Solano location.

PB82-151796 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report at GF Business Equipment, Inc., 229 East Dennick Avenue, Youngstown, Ohio 44501,
Marshal S. Levine, and Newton E. Whitman. 22 Oct 79, 27p IWS-74.27
Contract PHS-NIOSH-210-77-0096

Worker exposures to paint materials were studied at GF Business Equipment, Incorporated (SIC-2542) in Youngstown, Ohio, on December 5, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. The number of employees assigned to the painting operations at this facility ranged from 50 to 100, depending on the season. The company had a safety and industrial hygiene program. Medical services were furnished by a part-time physician and five nurses. Personnel records provided demographic information, department assignments, and seniority listings. Approximately 6,000 gallons of paint were used per week, consisting of enamels, polyester vinyls, amino alkyds, and acrylic/epoxies. There were about 24 paint booths used during painting operations and all were of the water wall type with exhaust vented to the outside. The authors conclude that this work force should be considered for inclusion in the painting hazards survey due to the large numbers of painters and the high paint use.

PB82-151861 PC **A07**/MF **A01**
Southern Research Inst., Birmingham, AL.
Sampling and Analysis of Four Organic Compounds Using Solid Sorbens, No. 1,
W. J. Barrett, H. K. Dillon, and R. H. James. Sep 74, 132p
Contract PHS-HSM-99-73-63

NIOSH-sponsored research on solid sorbent sampling methods and gas-chromatographic analytical methods for the determination of phosgene (75455), acrylonitrile (107131), nitroglycerin (55630), and ethylene glycol dinitrate (628966), and methyl chloride (74873) in industrial environments is described. It was noted that solid sorbents would be desirable for personal sampling pumps for collecting air samples for transport to the analytical laboratory. Suitable solid sorbents were found for all substances except phosgene. The vapors of the nitrate esters were collected on a porous polymer, desorbed by extraction with ethanol (64175), and determined by electron capture gas-chromatography. Acrylonitrile was collected on an activated carbon (7440440) derived from Saran (MX8013772) pyrolysis, desorbed by extraction with methanol (67561), and determined by flame ionization gas-chromatography. Methyl chloride was collected on an activated carbon similar to that used by NIOSH for collection of organic solvent vapors, desorbed with methanol, and determined by flame ionization gas-chromatography. Evaluation of the sampling and analytical systems for each substance indicated that each met NIOSH-standards for accuracy and precision.

PB82-152281 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Walk-through Survey Report of the Oral Contraceptive Manufacturing Operations at Ortho Pharmaceutical Corporation, Raritan, New Jersey.
Industrywide study.
Jun 79, 17p IWS-85.14

Worker exposure to estrogens were studied at the Ortho Pharmaceutical Corporation (SIC-2834) in Rari-

tan, New Jersey, on June 20, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational estrogen exposure. Approximately 40 of the employees at the facility were assigned to the estrogen processing area. The company maintained a safety and industrial hygiene program, and a medical program. Personnel records provided demographic data, department assignments, and absence reports. Symptoms of estrogen exposure have not been reported among processing technicians since 1976. Work categories with the greatest potential for estrogen exposure were processing technicians, packaging area operators, quality assurance inspectors or laboratory technicians, and maintenance workers. The authors conclude that this workforce should not be included in the epidemiological study since all personnel records are destroyed 7 years after employee termination. In addition, only a relatively small number of employees are exposed to the estrogens, women are excluded from the production area, and the exposure period is relatively short.

PB82-152299 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report at Drexel Heritage Furnishings, Inc., Drexel, North Carolina 28619,
Genevieve M. Matanoski, Peter S. J. Lees, and J. Herbert O'Toole. 10 Jul 79, 28p IWS-74.13
Contract PHS-NIOSH-210-77-0096

Worker exposure to paint materials were studied at Drexel Heritage Furnishing, Incorporated (SIC-2512) in Drexel, North Carolina, from July 31 to August 1, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. Approximately 1,000 of the employees at the facility were assigned to the finishing operations surveyed. Medical services were furnished by one nurse in each complex. Personnel records provided demographic information and department assignments. Numerous types of wood stains, thinners, solvent, sealers, lacquers, printing inks, and filiers and glazes were used. Exposure control methods at the facility were representative of the furniture industry in general. The authors recommend that the Drexel Heritage facility by included in the NIOSH paint hazard survey.

PB82-152836 PC **A18**/MF **A01**
Stanford Research Inst., Menlo Park, CA.
Evaluation of Existing Data Sources of Occupational Injury and Illness Statistics,
David P. Discher, M. A. Raymond, and C. R. Witwer. Jun 76, 406p OSHA/RP-81/003
Contract J-9-F-5-0147
Portions of this document are not fully legible.

This report gives descriptions of 16 sources potentially useful for developing national injury and illness statistics. Their usefulness to five user programs (Standards development, standards enforcement, education and consultation, Occupational safety and health research, project justification and evaluation) is evaluated and possible modifications to these systems are discussed with respect to increasing their usefulness to those user programs. Information gaps are identified in the ability of statistical sources to meet the needs of the five program areas. This report also discusses six alternative models of federal programs for the collection and analysis of national statistics on occupational injury and illnesses.

PB82-153347 PC **A07**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Industrial Hygiene Characterization of Urea Formaldehyde and Polyurethane Foam Insulation,
Andrew A. Alcarese, Jr., and Robert P. Reisdorf. Oct 80, 138p
Contract PHS-210-78-0081

Industrial hygiene surveys were conducted at eight facilities manufacturing and applying urea formaldehyde (9011056) and polyurethane (68400679) thermal insulation foam. Concentrations of formaldehyde (50000) ranged from less than 0.08 to 5.4 parts per million (ppm) in manufacturing facilities. A concentration of 300ppm of ammonia (7664417) was measured in a breathing zone at one manufacturing facility. Measurements for furfuryl-alcohol (98000), acetaldehyde (75070), phenol (108952), nitrosamines, and respirable dust were below detectable concentrations. Noise levels ranged from 83 to 99 and 96 to 105 decibels on the A-weighted scale (dBA) in manufacturing and application facilities, respectively. Wet bulb globe temperatures (WBGT) were as high as 29 degrees C in manufacturing facilities. Concentrations of diphenylmethane-diisocyanate (101688) (MDi), toluene-dissocyanate (26471625) (TDI), and fluorotrichloromethane (75694) (FTM) polyurethane foam ranged from less than 0.002 to 0.0050ppm, 22 to 310 parts per billion, and 0.95 to 193ppm, respectively. For application activities, concentrations of MDI, FTM alpha-methyl-styrene (98839) and carbon-monoxide (630080) ranged from less than 0.0010 to 0.068, 1.6 to 180, 0.17 to 0.21, and 30 to 50 ppm respectively. The authors note that the OSHA standards for formaldehyde are an 8 hour time weighted average (TWA) limit of 3ppm, for ammonia an 8 hour TWA of 50ppm; for MDI and TDI a ceiling limit of 0.02ppm; for FTM 1,000ppm; for alpha-methyl-styrene 100ppm; and for carbon-monoxide 50 ppm. The OSHA noise standard is 90 dBA for an 8 hour period. A standard of WBGT of 26.7 degrees C for moderate work is recommended by the American Conference of Governmental Industrial Hygienist. The authors conclude that formaldehyde, ammonia, MDI and TDI concentrations, noise and WBGT levels exceeded the standards and they recommend immediate corrective actions.

PB82-154253 PC **A09**/MF **A01**
WSA, Inc., San Diego, CA. Safety Sciences Div.
Application of Ergonomics to Occupational Safety. Final rept.
Apr 78, 191p 712F, NIOSH-210-77-034
Contract PHS-NIOSH-210-77-0034

A bibliography of over 850 citations to the literature on the application of ergonomics to occupational safety is presented. Citations are given under the headings of general ergonomics, human factors, safety, behavior, worker characteristics, equipment, workplace design, personal protective equipment, job design, training, motivational approaches, safety programs and industry studies.

PB82-155458 PC **A09**/MF **A01**
Ryckman, Edgerley, Tomlinson and Associates, Inc., St. Louis, MO.
Industrial Hygiene Inspection Procedures Guide.
1981, 186p
Contract PHS-99-72-97

First of three volumes of a manual intended to provide industrial hygienists with essential technical information in order to determine compliance with regulations, evaluate control measures, investigate problems in individual plants as well as on an industry-wide basis, and provide data for consultation with all parties concerning health problems. The main topics covered include: evaluation of the work environment in regard to hazardous conditions, statistical methods of sampling, recognition, evaluation and survey ofthe conditions; sampling and analysis of hazardous conditions, such as gases, vapors, aerosols, dusts, fumes, mists, physical hazards, radiation and airflow measurement; medical and biological procedures; interferences, limitations, precautions, calibrations, sampler collection efficiency and stability determination; calibration instruments and techniques for flow and volume calibration; data tables of more than 550 hazardous materials.

PB82-162512 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Hazard Evaluations and Technical Assistance Branch.
Technical Assistance Report No. 80-108-762 at Hubert Humphrey Building, Washington, DC.,
S. A. Lee. Nov 80, 7p TA-80-108-762

Environmental sampling and employee interviews were conducted on August 25, 1980, to investigate the air quality on the east side of the fifth floor of the Hubert Humphrey Building (SIC-9199) in Washington, D.C. The building houses the offices of the Health Budget Division of the U.S. Department of Health and Human Services. Employees complained about the absence of any air movement in their offices, inadequate temperature control, fainting, sluggishness, headaches and dizziness. The evaluation was requested by representatives of the employees. Short term colorimetric detector tubes were used to measure oxides of nitrogen, ozone (10028156), and formaldehyde (50000). All concentrations were below detection limits. Carbon-dioxide (124389) concentrations ranged from 0.03 to 0.04 percent. Short term carbon-monoxide (630080) concentrations along the road and inside the parking garage were 5 and 10 parts per million (ppm), respectively, and increased to 10 and 20ppm, respectively, during the rush hour. Short term CO concentrations were below detectable limits. Bulk samples analyzed by gas chromatography/mass spectrophotometry contained concentrations of 1,1,1-trichloroethane (71556), toluene (108883) and total aliphatic hydrocarbons of 0.04, 0.01 and less than 0.1ppm, respectively. These concentrations were significantly lower than current occupational health criteria. The author concludes that there were no health hazards due to air quality at the time of the survey. He recommends increased air circulation in the offices.

PB82-162538 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Industrial Hygiene Section.
Walk-through Survey Report of the Ferromanganese and Silicomanganese Manufacturing Operations at Ohio Ferro Alloys Corporation, Philo, Ohio 43771.
Industrywide study,
Robert Herrick, and Sanford Leffingwell. 15 Feb 80, 12p IWS-107.10

Worker exposures to manganese (7439965) were determined at Ohio Ferro Alloys Corporation (SIC-1061) in Philo, Ohio, on March 21, 1979. The survey was part of a series of NIOSH studies of occupational manganese exposure. Approximately 567 of the employees were assigned to the production areas, with greatest potential manganese exposure expected for furnacemen, helpers, and crusher operators. The company had a safety and industrial hygiene program. Medical services were furnished by a consulting physician and a full-time nurse. Primary air sampling was conducted near the working positions of the pitman and helper at one silicomanganese producing furnace. All samples were below the OSHA standard of 5 milligrams per cubic meter for the manganese. Area samples collected near the working stations of the pitman, helper and charger also indicated that personal exposures to manganese were below OSHA standards. The authors conclude that this workforce should not be included in the NIOSH manganese hazard study because of the low concentrations of airborne manganese and the small number of exposed workers.

PB82-162546 PC **A03**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Walk-through Survey Report, ACF Industries, Amcar Division, Milton, Pennsylvania 17847,
Marshal S. Levine, and Newton E. Whitman. 17 Oct 79, 26p IWS-74.62
Contract PHS-NIOSH-210-77-0096

Worker exposures to paint materials were studied at ACF Industries, Amcar Division (SIC-3743) in Milton, Pennsylvania, on June 6, 1979. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational paint materials exposure. Approximately 12 of the employees at this facility were assigned to the painting operations that were surveyed. The company had a safety and industrial health program. Medical services were furnished by a part-time physician and one nurse per work shift. Personnel records provided demographic information, department assignments, and seniority listings. Approximately 2,000 gallons of paint were used per week, including zinc-chromate primers, and vinyl-alkyd finishes. The paint booth utilized an exhaust ventilation system, and all spray painters were equipped with air supplied respirators. The authors conclude that this workforce should be included in the NIOSH painting hazards survey.

PB82-162553 PC **A04**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Industrial Hygiene Section.
In-Depth Industrial Hygiene Survey Report on Styrene Exposure at Uniflite, Inc., Bellingham, Washington.
Industrywide study,
Michael S. Crandall. May 79, 61p IWS-78.17

Worker exposures to styrene (100425) were determined at Uniflite, Incorporated (SIC-3732) in Bellingham, Washington, from August 21 to 24, 1978. The company was under consideration for inclusion in a NIOSH study of the health effects of occupational styrene exposure. The company employed 378 workers in the production areas surveyed. The company had a safety and industrial health program. Medical services were furnished by local clinics and workers trained in first-aid. Styrene concentrations in 19 of 171 individual charcoal tube samples exceeded the OSHA standard of 100 parts per million (ppm) for an 8 hour time weighted average. Acetone (67641) samples ranged

from 17 to 252 ppm; compared with the OSHA standard of 1000 ppm. The authors recommend improved ventilation and use of respirators.

PB82-162595 PC **A05**/MF **A01**
SRI International, Menlo Park, CA.
Occupational Health Assessment of the Geothermal Hydrothermal Convection Industry.
Final rept.,
Mary A. Zerwas, C. Richard Witwer, Robert E. Freeman, Alfredo Salazar, and Konrad Semrau. Sep 79, 76p
Contract PHS-NIOSH-210-77-0031

This report presents the results of a literature review and data collected through personal contacts and a site visit to The Geysers, a geothermal electricity generating station in Sonoma County, California. The objectives of the study were to: (1) Acquire information on and assess the potential health and safety problems in the geothermal hydrothermal convection industry from the available literature, by contacting people working in the industry and related areas, and by conducting a walk-through survey of The Geysers. (2) Identify areas of research that should be undertaken to develop effective measures to ensure the health and safety of workers employed in this developing industry.

6K. Life Support

PAT-APPL-6-295 398 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Heated Breathing Bag Sheath.
Patent Application,
James F. Wattenbarger. Filed 24 Aug 81, 13p AD-D009 065/4
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A sheath device for heating breathing bags and hoses of underwater breathing apparatus employs a fabric enclosure for the breathing bags, walls of which enclosure are formed of two layers sealed together at a plurality of discrete points to define water passages within sealed boundary lines. Tubular water conducting enclosures for the breathing hoses are connected to the enclosures in communication with the water passages in the walls, and flexible tubular dams connected to the device and to the hoses direct water flow from the wall passages into the hose enclosures. (Author)

6L. Medical and Hospital Equipment

INIS-mf-6276 PC **A02**/MF **A01**
Regulations of 2 November 1979 Relating to the Right to Use X-Ray Apparatus for Medical Purposes. Delegation of Authority.
2 Nov 79, 1p
In Norwegian.
U.S. Sales Only.

This Royal Decree lays down regulations which prescribe the qualifications for using X-ray devices for medical purposes. The State Institute of Radiation Hygiene is the competent authority. These regulations were made pursuant to Act No. 1 of 18 June 1938 on the use of X-rays and radium and entered into force on 1 January 1980. (Atomindex citation 12:578410)

PB82-153289 Not available NTIS
National Bureau of Standards, Washington, DC.
Marginal Adaptation of BIS-GMA Based Composites Containing Various Diluents,
G. M. Brauer, D. M. Dulik, H. N. Hughes, K. Dermann, and N. W. Rupp. Dec 81, 6p
Sponsored in part by Army Medical Research and Development Command, Washington, DC.
Pub. in Jnl. of Dental Research 60, n12 p1966-1971 Dec 81.

The objective of this study was to determine the gap formation and marginal leakage of dental restorative resins containing various diluents and diluent concentrations. Marginal adaptation of composites thermocycled for one week between 5 and 55C is dependent on the type and concentration of polymerizable monomer diluent present in the resin formulation. Curing shrinkage of the resin is a major contributor to breaking the marginal seal. Addition of dimethacrylate diluents containing (CH2)n recurring units generally yield composites with better marginal adaptation than those containing (CH2CH2O)n groups. Marginal leakage is reduced on lowering the diluent concentration. Optimum adaptation will be obtained for compositions containing a minimum percentage of diluent with clinically acceptable working properties. Volume changes on temperature cycling resulting from differences in thermal expansion coefficients of composites do not affect the marginal integrity as much as does curing shrinkage.

PB82-154238 PC **A03**/MF **A01**
Pittsburgh Univ., PA.
Research, Development, and Evaluation of Systems for Noninvasive Detection and Quantification of Atherosclerotic Lesions in Peripheral and Coronary Arteries.
Comprehensive annual rept. 30 Sep 80-29 May 81,
Donald Sashin. 1981, 31p
Contract N01-HV-02929

The report describes the first 8 months of research, development and evaluation of an advanced high-speed system for Computerized Electronic Radiography designed to achieve a noninvasive detection and quantification of atherosclerotic lesions in deep-lying vessels including the coronary artery. The system under development involves the use of a conventional x-ray source to produce an electrical charge image in linear arrays of light-sensitive diodes that are fiber-optically rather than lens-coupled to a digital computer for processing and display of a visual image of blood vessels containing relatively low amounts of radiographic contrast media such as can be readily produced by noninvasive intravenous injection. As in the earlier prototype, the x-rays are collimated to form a thin, fanshaped beam that allows highly efficient rejection of scattered x-rays, thereby maximizing the ability to detect small contrast differences in deep lying vessels.

PB82-154543 PC **A09**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
The Development and Evaluation of Tests for Safety and Efficacy of Cuffed Tracheal Tubes.
Final rept.,
William G. Yates, and Robert N. Schaap. 31 Oct 78, 191p TR-1602-008, FDA/BMD-82/21
Contract FDA-223-74-5253

This report represents the results of a study involving the development and evaluation of tests for determining the safety and performance of cuffed tracheal tubes. Included in this document are (1) a detailed statement of the scope and significance of the potential hazards associated with the use of these devices (2) an evaluation of the feasibility, practicality and validity of testing procedures including a test for the evaluation of tracheal injury, and (3) a review of the existing tracheal tube standards (ANSI Z-79.1-1974 and ANSI Z-79.5-1974).

PB82-862020 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Autoclave Design and Performance. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 90p

This bibliography contains citations concerning steam and hot air antoclave design and use. Sterilizers for medical, dental equipment and supplies, pharmaceuticals and food products are discussed. Continuous, automatic, and programmed systems are considered, and plastic and metal storage containers are discussed. Performance and reliability are also discussed. (Contains 97 citations fully indexed and includes a title list.)

6M. Microbiology:

AD-A109 229/5 Not available NTIS
Connecticut Univ. Health Center, Farmington. Dept. of Biochemistry.
Levels of H(+) and Other Monovalent Cations in Dormant and Germinating Spores of Bacillus megaterium,
Bonnie Massey Swerdlow, Barbara Setlow, and Peter Setlow. 6 Apr 81, 11p ARO-17029.2-L
Contract DAAG29-80-C-0062
Availability: Pub. in Jnl. of Bacteriology, v148 n1 p20-29 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-153669 PC **A04**/MF **A01**
North Carolina Univ. at Chapel Hill.
Algal-Bacterial Symbiosis in the Chowan River, North Carolina.
Master's thesis,
Kathleen K. Gallucci. 1981, 71p W82-02177, OWRT-B-127-NC(3)
Contract DI-14-34-0001-0274

Bacteria from the Chowan River, NC, were counted and isolated during the summer of 1980 and the significant species in the bloom area was identified as Pseudomonas aeruginosa (Schroeter) Migula. When this organism was added to axenic cultures of the blue-green alga Anabaena flosaquae (lyng.) Breb., the total amount of nitrogen fixed (as determined by acetylene reduction) by the alga was substantially greater than that fixed by axenic controls. A radioactive assay was used to determine the chemotactic response of Pseudomonas aeruginosa to several amino acids, the primary units of blue-green algal nitrogenous exudates. Chemotaxis was observed, to some degree, towards all of the amino acids tested, although the bacterium did not utilize all of them for growth. Thus, in the Chowan River, chemotaxis is the likely mechanism whereby this bacterium detects nutrient-rich microzones along the algal filaments. Other studies have demonstrated that bacteria recycle nutrients in the algal microenvironment and enhance algal nitrogen fixation. Algal-bacterial symbiosis, based on nutrient exchanges, may be a significant factor in the proliferation of blue-green algal nuisance blooms such as those which have appeared on the Chowan River.

PB82-153768 PC **A02**/MF **A01**
North Carolina Univ. at Chapel Hill.
'Spodoptera frugiperda' Nuclear Polyhedrosis Virus Genome: Physical Maps for Restriction Endonucleases BamHI and HindIII.
Journal article,
Lambert C. Loh, John J. Hamm, and Eng-Shang Huang. 9 Mar 81, 12p EPA-600/J-81-517
Grant EPA-R-806210
Pub. in Jnl. of Virology, v38 n3 p922-931 Jun 81. Prepared in cooperation with Department of Agriculture, Tifton, GA.

The physical map for the genome of Spodoptera frugiperda nuclear polyhedrosis virus was constructed for restriction endonucleases BamHI and HindIII. The ordering of the restriction fragments was accomplished by cross-blot hybridization of BamHI, HindIII, and EcoRI fragments. The alignment of the HindIII fragments within the BamHI map was achieved by double digestion with the two restriction endonucleases followed by cross-blot hybridization. The results showed that the viral genome consisted of mainly unique sequences. In addition, the circular nature of the viral genome was reaffirmed.

PB82-862251 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Bacterial Starter Cultures Used by the Dairy Industry. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 136p

This bibliography contains citations concerning bacterial starter cultures used by the dairy industry. Factors that effect the growth, acid production, flavor, and texture of the final product are discussed. The quality control of the bacterial strains used for culture dairy products, including bacteriophage and other contaminants, are also considered. Specific bacterial strains are dis-

cussed. (Contains 134 citations fully indexed and includes a title list.)

PB82-862483 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Immobilized Microbial Cells: Production and Conversion of Products. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 152p

This bibliography contains citations concerning the use of immobilized microbial cells for the production, purification, and conversion of biological products. Alcohol production and energy conversion from waste products are also discussed. Cell entrapment methods and carriers for the cells are considered. (Contains 144 citations fully indexed and includes a title list.)

PB82-862749 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Immobilized Microbial Enzyme Systems: Preparation and Properties. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 203p

This bibliography contains citations concerning the preparation, purification, and properties of immobilized microbial enzyme systems. Immobilization and hydrolysis kinetics of numerous microbial enzyme systems are discussed. Specific applications, including applications for the food industry, are considered. (Contains 206 citations fully indexed and includes a title list.)

PB82-930300 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Virus Studies in Humans and Other Primates.
Cancergram CB04.
1982, 12 issues
Supersedes PB81-930300.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

All aspects of human and other primate (gibbon, ape, marmoset, chimpanzee, baboon, lemur, monkey) viruses of interest to cancer researchers are within the scope of this Cancergram. Only studies carried out in human and other primate cells will be included. Abstracts are included on identification, structure, classification, characterization, immunology, life cycle events, and possible and established etiological relationships to oncogenesis. Complementary to this series is Cancergram series CB11, DNA Tumor Viruses in Non-primate Systems.

PB82-931000 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Viral Immunology.
Cancergram CB13.
1982, 12 issues
Supersedes PB81-931000.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram covers antigens identified with all viruses associated with cancer: both DNA and RNA viruses, in humans, other primates, and in subprimate species. The antigens may be expressed within infected cells, on cell surfaces, on free virus particles, or in cell-free fluids or extracts. Emphasis is placed on characterization of the antigens of particular viruses and viral components. Selected abstracts concerning the immune response of the host cell to viruses and viral antigens are also included.

PB82-931500 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
DNA Tumor Viruses in Non-Primate Systems.
Cancergram CB11.
1982, 12 issues
Supersedes PB81-931500.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

All studies on DNA viruses of established or potential significance in cancer etiology are in scope, excluding all studies of DNA viruses in humans and other primates. However, all studies of human and other primate DNA viruses conducted in animal cells other than humans or other primates are included. Studies concerning the excluded viruses related to primate systems appear in Cancergram series CB04.

PB82-931600 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
RNA Viruses Associated with Cancer: Cell Biology and Animal Studies.
Cancergram CB22.
1982, 12 issues
Supersedes PB81-931600.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

All aspects of the biology of certain RNA viruses at the cellular or animal level will be covered in this Cancergram. The scope encompasses all RNA viruses, including those infecting human tissues, which have established or potential significance in cancer etiology. Emphasis is placed on cell-virus interactions including host alteration, transformation, and other virally induced morphological changes, as well as studies of viral genetics, replication, and expression. Molecular aspcts of viral cancer biology are covered by Cancergram CB23, entitled RNA Viruses Associated with Cancer--Molecular Biology.

PB82-931700 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
RNA Viruses Associated with Cancer: Molecular Biology.
Cancergram CB23.
1982, 12 issues
Supersedes PB81-931700.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram concentrates on molecular aspects of all RNA viruses of established or potential significance in cancer etiology, including those infecting human tissues. Topics featured include viral RNA and protein chemistry, reverse transcription, viral DNA intermediates, and proviral DNA. Cellular and animal level studies of these RNA viruses are covered by Cancergram CB22, entitled RNA Viruses Associated With Cancer--Cell Biology and Animal Studies.

6N. Personnel Selection and Maintenance (Medical)

AD-A109 270/9 PC **A08**/MF **A01**
Integrated Sciences Corp., Santa Monica, CA.
Female and Male Size, Strength and Performance: A Review of Current Literature,
Mark D. Phillips, Anne Bogardt, and Ross L. Pepper. Oct 81, 159p ISC-342-1, NOSC-CR-107
Contract N00123-80-D-0104

The increase in female personnel utilization aboard ship has initiated a need to examine gender based differences in anthropometrics, biomechanics, psychophysical performance, physiological attributes and the relationship of these factors to the design of shipboard equipment and fittings. Literature in this area was examined by Ayoub et al (1978). The purpose of the present report was to update and extend the baseline established by Ayoub et al (1978) by examining current work.

AD-A109 309/5 PC **A05**/MF **A01**
Anthropology Research Project, Inc., Yellow Springs, OH.
Integrated Size Programs for U.S. Army Men and Women.
Technical rept.,
Kathleen M. Robinette, Thomas Churchill, and Ilse Tebbetts. Jul 81, 96p NATICK-TR-81/032, NATICK/IPL-236
Contract DAAK60-79-C-0097

Appearing in this report for the first time are anthropometric sizing programs developed for Army field clothing to be worn by both men and women. Dimensional data were derived from a statistical analysis of body size data obtained from Army men and women, and take into account not only size differentials but the marked proportional differences which exist between the two sexes. Formatted for use by clothing designers and patternmakers, the bulk of the report consists of sizing tables which include recommended design values for a total of 26 dimensions for each of 20 sizes. Two separate programs are given, one devised for upper body garments and one for lower body garments. Although clothing designs based on these sizing programs have not, at this writing, been executed and field tested, these data are felt to be the most promising yet available to accommodate all Army personnel. (Author)

AD-A109 406/9 PC **A04**/MF **A01**
Anthropology Research Project, Inc., Yellow Springs, OH.
An Investigation of Integrated Sizing for US Army Men and Women.
Technical rept.,
John T. McConville, Kathleen M. Robinette, and Robert M. White. Aug 81, 70p NATICK-TR-81-033, NATICK/IPL-242
Contract DAAK60-79-C-0097

Described in this report is a step-by-step analysis of anthropometric sizing data leading to the development of integrated sizing programs for use in the design field clothing for Army men and women. Spurred by the need to clothe and equip increasing numbers of women for almost all of the Army's occupational specialties, and by the failure of scaled-down men's sizes to properly fit many women, this research was undertaken to identify the critical dimensional differences between men and women, and to devise single sizing systems which would take these variations into account. Concepts underlying the development of anthropometric sizing systems, the problems unique to sizing for a mixed male/female population, and analytical procedures employed in seeking an effective sizing solution are all described here in some detail. Alternative sizing schemes, beginning with those based on traditional key dimensions, are examined and two 20-size programs--one each for upper-- and lower-body garments--are recommended.

6O. Pharmacology

AD-A108 941/6 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Leishmania donovani, Plasmodium berghei, Trypanosoma rhodesiense: Antiprotozoal Effects of Some Amidine Types,
Edgar A. Steck, Kenneth E. Kinnamon, Dora S. Rane, and William L. Hanson. 20 Nov 80, 11p
Pub. in Experimental Parasitology, v52 p404-413 1981.

No abstract available.

AD-A109 120/6 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Thyrotropin-Releasing Hormone Improves Cardiovascular Function in Experimental Endotoxic and Hemorrhagic Shock,
John W. Holaday, Robert J. D'Amato, and Alan I. Faden. 29 Jan 81, 5p
Pub. in Science, v213 p216-218 Jul 81.

No abstract available.

AD-A109 170/1 PC **A03**/MF **A01**
Federal Aviation Administration, Washington, DC. Office of Aviation Medicine.
A Comparison of Some Effects of Three Antimotion Sickness Drugs on Nystagmic Responses to Angular Accelerations and to Optokinetic Stimuli,
William E. Collins, David J. Schroeder, and Gary W. Elam. Aug 81, 28p Rept no. FAA-AM-81-16

In aviation, some pilot trainees experience motion sickness early in their training and drug remedies are not prohibited when prescribed for dual flights. Moreover, some motion sickness preventives do not require prescriptions. In addition, spouses or business associates often accompany private pilots on flying trips; some of these passengers, who may be required to pilot the

aircraft in an emergency, use antimotion sickness drugs. While the basic efficacy of such drugs is rooted in the reduction of motion sickness symptoms, adverse side effects are important practical considerations of their usage in aviation. This study examined the influence of three established antimotion sickness drugs on nystagmic eye movement responses to angular acceleration (whole-body movement) with vision either permitted or denied, and to optokinetic stimulation (visual field movement). Dimenhydrinate and promethazine hydrochloride, particularly at higher dose levels, reduced optokinetic nystagmus, thereby making less accurate the following ability of the eye. During whole-body motion in darkness, there was little placebo-drug difference in the vestibular response under alert conditions; under relaxed conditions, dimenhydrinate and promethazine hydrochloride produced significant declines in the vestibular eye movements. These same drugs also interfered with the ability of the individual to fixate adequately on a visual task during motion. Subjects who received a combination of promethazine plus d-amphetamine were able to suppress vestibular eye movements under the task condition and maintain good visual fixation.

AD-A109 227/9 Not available NTIS
Massachusetts Inst. of Tech., Cambridge.
Arginine Regulation of Gramicidin S Biosynthesis,
Agnes Poirier, and Arnold L. Demain. 17 Apr 81, 7p ARO-14926.4-L
Contract DAAG29-78-C-0015
Availability: Pub. in Antimicrobial Agents and Chemotherapy, v20 n4 p508-514 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 230/3 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Interaction of Imipramine with the Ionic Channel of the Acetylcholine Receptor of Motor Endplate and Electric Organ,
Mohyee E. Eldefrawi, Jordan E. Warnick, G. G. Schofield, Edson X. Albuquerque, and Amira T. Eldefrawi. 9 Feb 81, 5p ARO-15761.29-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Availability: Pub. in Biochemical Pharmacology, v30 n11 p1391-1394 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 232/9 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Detection of Nicotinic Cholinergic Transmission in Malapterurus electricus Electroplax,
M. E. Eldefrawi, N. Shaker, Nabil A. Mansour, J. E. Warnick, and E. X. Albuquerque. 29 Jun 81, 6p ARO-15761.27-L
Grants DAAG29-78-G-0203, PHS-NS-12063
Availability: Pub. in Life Sciences, v29 n10 p1033-1037 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 234/5 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Inhibition of Calcium-Dependent ATPase from Sarcoplasmic Reticulum by a New Class of Indolizidine Alkaloids, Pumiliotoxins A, B, and 251D,
R. Tamburini, E. X. Albuquerque, J. W. Daly, and F. C. Kauffman. 3 Mar 81, 7p ARO-15761.24-L
Grants DAAG29-78-G-0203, PHS-NS-14728
Availability: Pub. in Jnl. of Neurochemistry, v37 n3 p775-780 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 238/6 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Elucidation of the Mechanism and Site of Action of Quinuclidinyl Benzilate (QNB) on the Electrical Excitability and Chemosensitivity of the Frog Sartorius Muscle,
G. G. Schofield, J. E. Warnick, and Edson X. Albuquerque. 17 Dec 80, 23p ARO-15761.15-L
Grants DAAG29-78-G-0203, PHS-NS-12063
Availability: Pub. in Cellular and Molecular Neurobiology, v1 n2 p209-230 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 239/4 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
3H Phencyclidine: A Probe for the Ionic Channel of the Nicotinic Receptor.
M. E. Eldefrawi, A. T. Eldefrawi, R. S. Aronstam, M. A. Maleque, and J. E. Warnick. 1980, 5p ARO-15761.9-L
Grant DAAG29-78-G-0203
Availability: Pub. in Proceedings of the National Academy of Science USA, v77 n12 p7458-7462 Dec 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 240/2 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
The Ionic Channel of the Acetylcholine Receptor: Regulation by Sites Outside and Inside the Cell Membrane Which are Sensitive to Quaternary Ligands,
L. G. Aguayo, B. Pazhenchevsky, J. W. Daly, and Edson X. Albuquerque. 22 Sep 80, 12p ARO-15761.13-L
Grants DAAG29-78-G-0203, PHS-DA-02534
Sponsored in part by Grant PHS-NS-12063.
Availability: Pub. in Molecular Pharmacology, v20 p345-355 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 241/0 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Coupling between the Nicotinic Acetylcholine Receptor Site and the Ionic Channel Site,
Mohyee E. Eldefrawi, and Amira T. Eldefrawi. 1980, 15p ARO-15761.8-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Pub. in Annals of the New York Academy of Sciences, v358 p239-252, 23 Dec 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 242/8 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Voltage- and Time-Dependent Actions of Piperocaine on the Ion Channel of the Acetylcholine Receptor,
Thomas N. Tiedt, Edson X. Albuquerque, Nabil M. Bakry, Mohyee E. Eldefrawi, and Amira T. Eldefrawi. 29 Jan 79, 14p ARO-15761.2-L
Grants DAAG29-78-G-0203, PHS-NS-12063
Sponsored in part by Grant NSF-BNS76-21683.
Availability: Pub. in Molecular Pharmacology, v16 p909-921 1979 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 244/4 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Phencyclidine Interactions with the Ionic Channel of the Acetylcholine Receptor and Electrogenic Membrane,
Edson X. Albuquerque, Ming-Cheng Tsai, Robert S. Aronstam, Bernhard Witkop, and Amira T. Eldefrawi. 4 Dec 79, 5p ARO-15761.17-L
Grant DAAG29-78-G-0203
Availability: Pub. in Proceedings of the National Academy of Science, v77 n2 p1224-1228 Feb 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 245/1 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Sites of Action of Phencyclidine. III. Interactions with Muscarinic Receptors,
Robert S. Aronstam, Mohyee E. Eldefrawi, Amira T. Eldefrawi, Edson X. Albuquerque, and Kam F. Jim. 9 Oct 79, 6p ARO-15761.5-I
Contract DAAG29-78-G-0203
Sponsored in part by Grants PHS-NS-12063 and PHS-HL-16003.
Availability: Pub. in Molecular Pharmacology, v18 p179-184 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 246/9 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Nereistoxin Interaction with the Acetylcholine Receptor-Ionic Channel Complex,
Amira T. Eldefrawi, Nabil M. Bakry, Mohyee E. Eldefrawi, Ming-Cheng Tsai, and Edson X. Albuquerque. 23 Jul 79, 9p ARO-15761.18-L
Grants DAAG29-78-G-0203, PHS-AI-13640
Sponsored in part by Grants PHS-NS-15261 and PHS-NS-12063.
Availability: Pub. in Molecular Pharmacology, v17 p172-179 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 249/3 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Regulation of (3H) Perhydrohistrionicotoxin Binding to Torpedo ocellata Electroplax by Effectors of the Acetylcholine Receptor,
Robert S. Aronstam, Amira T. Eldefrawi, Isaac N. Pessah, John W. Daly, and Edson X. Albuquerque. 29 Feb 80, 9p ARO-15761.11-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Sponsored in part by Grant PHS-NS-12063.
Availability: Pub. in The Jnl. of Biological Chemistry, v256 n6, p2843-2850, 25 Mar 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 339/2 PC **A02/MF A01**
North Carolina Univ. at Chapel Hill. School of Medicine.
Chemical Stimulation and Assay of the Hypothalamus of the Conscious Monkey.
Rept. for 1 Dec 79-31 May 81,
R. D. Myers. 1981, 5p
Contract N00014-79-C-0078

Research was undertaken which was devoted to an understanding of the fundamental neurochemical mechanisms in specific regions of the brain that control vital physiological and behavioral processes. The neurohumoral factors within the diencephalon that are responsible for body temperature, feeding, drinking and other vegetative functions were investigated.

AD-A109 353/3 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Interaction of Tricyclic Antidepressants with the Ionic Channel of the Acetylcholine Receptor of Torpedo Electric Organ,
N. Shaker, A. T. Eldefrawi, E. R. Miller, and M. E. Eldefrawi. 30 Apr 81, 9p ARO-15761.20-L
Grants DAAG29-78-G-0203, PHS-NS-15261
Availability: Pub. in Molecular Pharmacology, v20 p511-518 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 355/8 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Anatoxin-a: A Novel, Potent Agonist at the Nicotinic Receptor,
C. E. Spivak, B. Witkop, and E. X. Albuquerque. 21 Feb 80, 12p ARO-15761.6-L
Grants DAAG29-78-G-0203, PHS-NS-12063
Availability: Pub. in Molecular Pharmacology, v18 p384-394 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 356/6 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Sites of Action of Phencyclidine. II. Interaction with the Ionic Channel of the Nicotinic Receptor,
E. X. Albuquerque, Ming-Cheng Tsai, R. S. Aronstam, A. T. Eldefrawi, and M. E. Eldefrawi. 9 Oct 79, 13p ARO-15761.4-L
Grants DAAG29-78-G-0203, PHS-NS-12063
See also AD-A109 245.
Availability: Pub. in Molecular Pharmacology, v18 p167-178 1980 (No copies furnished by DTIC/NTIC.

No abstract available.

AD-A109 357/4 Not available NTIS
Maryland Univ., Baltimore. School of Medicine.
Sites of Action of Phencyclidine. I. Effects on the Electrical Excitability and Chemosensitive Properties of the Neuromuscular Junction of Skeletal Muscle,
Ming-Cheng Tsai, Edson X. Albuquerque, Robert S. Aronstam, Amira T. Eldefrawi, and Mohyee E. Eldefrawi. 9 Oct 79, 9p ARO-15761.3-L
Grants DAAG29-78-G-0203, PHS-NS-12063
See also AD-109 356. Sponsored in part by grants PHS-NS15261 and PHS-HL-16003.
Availability: Pub. in Molecular Pharmacology, v18 p159-166 1980 (No copies furnished by DTIC).

Group 6O—Pharmacology

No abstract available.

PB82-861626 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Opiate Receptors: Pharmacology and Biochemistry. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 161p

This bibliography contains citations concerning the interaction of opiates with their receptors. Pharmacological and biochemical characterization of opiate receptor binding are discussed, and localization of opiate receptors is considered. Opiate receptor antagonists are also discussed. (Contains 168 citations fully indexed and includes a title list.)

PB82-862475 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cosmetics: Chemical and Biological Properties. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 183p

This bibliography contains citations concerning the chemical, pharmacological, and toxicological properties of cosmetics. The carcinogenicity and hypersensitivity of cosmetic ingredients are described; and microbial studies, including the anti-bacterial activity of preservatives, are considered. Specific ingredients are discussed; methods of analysis, both chemical and biological, are described. (Contains 190 citations fully indexed and includes a title list.)

PB82-862871 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Disinfectants: Phenolic Compounds. 1978-February, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for 1978-Feb 82.
Feb 82, 124p

This bibliography contains citations concerning phenolic compounds and their antimicrobial activity. Specific substituted phenols and their applications and mode of action are discussed. Assay methods to evaluate the effectiveness of these agents are also considered. (Contains 100 citations fully indexed and includes a title list.)

PB82-932200 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Antitumor and Antiviral Agents: Mechanisms of Action.
Cancergram CB19.
1982, 12 issues
Supersedes PB81-932200.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram concerns preclinical studies of any drugs and agents that have, or are being tested for, antitumor, antimetastic, and/or antiviral properties, either in vivo or in vitro. The scope centers on the mechanism of action of the drugs (structure-activity relationships, effects exerted at the cellular or subcellular level), their metabolism (including transport, binding, and conversion), and physical and chemical analysis, characterization, and synthesis of the agents. Studies involving human patients are excluded. Studies concerning toxicity, pharmacokinetics, and efficiency of antitumor and antiviral agents are generally excluded unless they stress, or are coupled with, aspects listed above as in scope. These excluded areas are covered by Cancergram CB20, entitled Antitumor and Antiviral Agents--Experimental Therapeutics, Toxicology, Pharmacology.

6P. Physiology

AD-A109 139/6 PC **A03**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
A Study of the Human Visual System in Support of Automated Feature Extraction.
Research note Sep 79-Sep 80,
Frederick W. Rohde. Oct 81, 34p Rept no. ETL-0271

An in-depth study of the anatomy and architecture of the visual system was conducted. Signal processing along the visual pathway was analyzed. The functions of the major components of the visual system were studied and the number of neurons determined. A comparison of the visual system with a computer was made. The concept of a feature extraction system was developed and discussed. (Author)

AD-A109 259/2 PC **A02**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Hemispheric Lateralization and Handedness Correlation of Human Evoked 'Steady-State' Responses to Patterned Visual Stimuli.
Final rept. 1 Jul-31 Dec 78,
W. R. Klemm, W. D. Gibbons, R. G. Allen, and E. O. Richey. 13 Aug 79, 10p Rept no. SAM-TR-79-265
Pub. in Physiological Psychology, v8 n3 p409-416 1980.

No abstract available.

PB82-143447 PC **A03**/MF **A01**
Minnesota Univ., Minneapolis. Chronobiology Labs.
Autorhythmometry.
Journal article,
Franz Halberg, Renato Lauro, and Franca Carandente. Dec 81, 47p EPA-600/J-76-110
Grant EPA-R-804512
Pub. in La Riceria in Clinica e in Laboratorio, v6 n3 p207-250, 1976.Color illustrations reproduced in black and white.

The authors stress the importance of rhythmometry, thanks to which the time course and other peculiarities of any biological phenomenon can be evaluated by obtaining serial measurements, objectively quantifying their characteristic features, and working out special models with the aid of computers. Of special interest, particularly for the evaluation of reference standards, is autorhythmometry (AR), to be used at least for certain variables. This is the method by which each subject studies himself, performing a certain number of measurements in the course of the day (or month or year) of his body temperature, blood pressure, cardiac rhythm, grip strength, etc. In AR, the subject takes an active part in the study of his condition of health and it has been shown that in the majority of cases these measurements are done with the utmost accuracy and precision, providing that the purpose of the operations to be performed has been adequately explained. The wide spread use of AR, during more of less extended periods in a lifetime, would permit the assessment of the normal situation for each individual and thus offer the possibility of diagnosing any disorder at its very being; it would thus be of great prophylactic value. The authors refer to the example of arterial blood pressure; widely different values for the normal levels can be found in the texts of different authors. They also show that a certain pressure may be normal for a given subject at a certain time of day and be a sign of illness for another subject, or even for the same subject at a different time. The authors suggest the introduction of AR in the curriculum of secondary schools and into the routine for outpatients and inpatients. This practice would increase the availability of information on public health at a lower cost.

6Q. Protective Equipment

PAT-APPL-6-252 725 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Diving Suit with Neck and Wrist Seals.
Patent Application,
David C. Doerschuk. Filed 10 Apr 81, 10p AD-D009 063/9
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A diving suit is provided with neck and wrist opening seals each in the form of a right cylindrical annulus of open celled resilient foam rubber having a through passage a portion of which is cylindrical and a portion of which is frustoconical so that part of the annulus wall is of uniform thickness and part is tapered. The tapered portion overlies a conical, opening defining edge portion of the suit fabric and a band of nonstretch tape fixes the tapered edge portion of the annulus to the fabric while allowing the thicker wall portion to expand and contract as a head or hand is pushed through. The outer cylindrical surface beyond the tape is adapted to cooperate with a mask hood or glove cuff. (Author)

PB82-151515 PC **E03**/MF **E03**
National Joint Health and Safety Committee for the Water Service, London (England).
Guidelines for the Selection, Maintenance and Training in the Use of Respiratory Protective Equipment.
Health and safety guideline no. 3.
c1979, 37p ISBN-0-904561-69-0

The equipment referred to in this document is for the respiratory protection of persons against contaminated and/or oxygen deficient atmospheres only and does not include diving equipment. This information in this document is equally applicable to the water supply, land drainage and sewage treatment functions of the industry. As its name implies this document should be used by management when developing working procedures for work places where the atmosphere is, or may become, contaminated by dusts, fumes or gases to such an extent as to be injurious to the health of persons in that work place. The guideline identifies different types of atmospheric hazards that may occur in the work place and the appropriate respiratory protective equipment which will (if properly used and maintained) afford protection to persons. It also offers advice on the selection, maintenance and purchasing of equipment as well as the selection and training of personnel to use the equipment.

6R. Radiobiology

NUREG/CR-2200 PC **A03**/MF **A01**
Reynolds Electrical and Engineering Co., Inc., Las Vegas, NV.
Radiation Exposure of Transportation Workers Handling Large Quantities of Radioactive Packages.
Final rept. Jul 79-Sep 81,
B. P. Smith, W. J. Doppe, M. W. Lantz, and A. E. Bicker. Jan 82, 34p

The study was designed to investigate radiation exposures to transportation workers that handle large quantities of radioactive packages. One of the objectives was to determine the correlation between the doses received and the total Transportation Index (TI) for both cargo handlers and drivers. The data and observations suggest that for facilities that handle several hundred TI per week, there is a high probability that some of their workers will receive radiation exposures exceeding the recommendations for a nonradiation worker.

NUREG-0713-V2 PC **A06**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Management and Program Analysis.
Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1980.
Annual rept.,
Barbara G. Brooks. Dec 81, 110p
See also NUREG-0713-V1.

This report summarizes the occupational radiation exposure information that has been reported to the U.S.N.R.C. by commercial nuclear power reactors during the years 1969 through 1980. The bulk of the data presented in the report was obtained from annual radiation exposure reports submitted in accordance with the requirements of 10 CFR 20.407 and Regulatory Guide 1.16. Data on workers terminating their employment at nuclear power facilities was obtained from reports submitted pursuant to 10 CFR 20.408. The annual reports submitted by the 69 nuclear power plants that had completed at least one full year of operation as of December 31, 1980, indicated that the number of personnel monitored during 1980 was 133,898 persons and the annual collective dose incurred by these individuals was 53,796 man-rems. The average annual dose for each worker that received a measurable dose was 0.7 rems, and the average collective dose per reactor was 791 man-rems. The termi-

nation reports revealed that some 57,800 individuals completed their employment with one or more reactor facilities during 1980. Approximately 3,900 of these workers could be considered transients and they received an average dose of about 1 rem.

PB82-152646 Not available NTIS
National Bureau of Standards, Washington, DC.
Difficulties in Calculating Spectrum-Averaged Values of Neutron Dose Equivalent,
C. Eisenhauer, and R. Schwartz. Nov 81, 4p
Sponsored in part by Nuclear Regulatory Commission, Washington, DC.
Pub. in Health Physics 41, n5 p774-777 Nov 81.

The problem of inconsistencies in standard tabulations of the flux to dose rate conversion factor for neutrons is examined. It is shown that such inconsistencies can lead to uncertainties of 25% in the dose equivalent calculated for neutron spectra in maintenance areas of nuclear power reactors.

PB82-152653 Not available NTIS
National Bureau of Standards, Washington, DC.
Detailed Intercomparison of Calculated and Measured Ionization Yield Spectra for 20 MeV Neutrons and the Implications for High Energy Neutron Dosimetry,
Joseph Coyne, Joseph C. McDonald, H. G. Menzel, and H. Schuhmacher. 1981, 11p
Grant PHS-CA-26313-02
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Proceedings of Symposium Neutron Dosimetry (4th), Munich-Neuherberg, Germany, June 1-5, 1981, Paper in Radiation Protection 1, p213-223 1981.

Tissue-equivalent proportional counters have been used to measure ionization yield spectra for approximately 20 MeV neutrons at two different neutron facilities. The results of these measurements are compared with calculated ionization yield spectra which have been obtained by using the analytical method. The calculations have taken into account the variation of ionization yield with ion energy and ion type. The comparisons at 20 MeV indicate that fewer alpha particles are observed than are predicted by the calculations, and call into question the nuclear data used in these calculations. These facts could have important implications for neutron kerma factors and the measurement of neutron dose at high energies. Re-examination of results at 14.5 MeV indicate that there may already be problems at this energy. The need for better nuclear data in the energy region above 10 MeV is evident.

PB82-153792 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Experimental Biology Div.
Broadening of the RF Power-Density Window for Calcium-Ion Efflux from Brain Tissue.
Journal article,
William T. Joines, Carl F. Blackman, and Mark A. Hollis. 16 Mar 81, 10p EPA-600/J-81/509
Pub. in IEEE Translations on Biomedical Engineering, v28 n8 p568-573 Jan 81.

Blackman et al. have reported enhanced efflux of calcium ions from chicken forebrains, exposed in vitro in a 50 ohms stripline to 147 MHz radiation, modulated sinusoidally at 16 Hz. When the spacing between the sample tubes was 3.8 cm on center, enhancement occurred at an incident power density of 0.83 mW/sq cm, but not at 0.11, 0.55, 1.11, or 1.38 mW/sq cm. When the spacing between sample tubes was reduced to 1.9 cm, significant enhanced efflux was observed at incident power densities of 0.55, 0.83, 1.11, and 1.38 mW/sq cm. This broadening of the effective power-density range is explained herein by calculations which show that the more closely spaced samples interact electrically in a way that both lowers and broadens the range of spatial variation of absorbed power density (microwatts/cu cm) within the sample for a given incident power density (mW/sq cm). Electrical coupling among the samples allows several different values of incident power to yield exactly the same value of power absorbed at given points within the brain sample. Because the absorbed power density must be directly related to the power that interacts with the brain to enhance the efflux of calcium ions, the electromagnetic conditions for efflux enhancement in coupled and uncoupled brains are the same if the absorbed power density is the same. Ranges of absorbed power density are identified that could be effective in enhancing the efflux of calcium ions from brain tissue.

PB82-154824 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Experimental Biology Div.
Observations of Rat Fetuses after Irradiation with 2450-MHz (CW) Microwaves.
Journal article,
E. Berman, H. B. Carter, and D. House. 24 Oct 80, 7p EPA-600/J-81-520
Pub. in Jnl. of Microwave Power 16(1), p9-13 1981.

Female Sprague-Dawley (CD) rats were exposed to 2450-MHz(CW) microwave radiation at incident power densities of 0 or 28 mW/sq cm for 100 min daily on the 6th through 15th day of gestation. The whole-body specific absorption rate at 28 mW/sq cm is estimated to be 4.2 W/kg. These exposure conditions raised rats' average colonic temperatures to 40.3C at the end of irradiation. There were 67 sham-irradiated and 70 microwave-irradiated females. When these groups were compared, no significant differences were found in pregnancy rates; in the numbers of live, dead, or total fetuses; in the incidences of external, visceral, or skeletal anomalies or variations; or in the body weight of live fetuses. It is concluded that these conditions do not have an effect on the gross structure of the fetal rat when applied repetitively during post-implantation pregnancy. It is also strongly suspected that this lack of an effect may hold true at any exposure level less than that which will kill a significant number of the dams by hyperthermia (colonic temperature > 40C).

PB82-154907 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Experimental Biology Div.
Broadening of the RF Power-Density Window for Calcium-Ion Efflux from Brain Tissue.
Journal article,
William T. Joines, Carl F. Blackman, and Mark A. Hollis. 16 Mar 81, 8p EPA-600/J-81-514
Pub. in IEEE Transactions on Biomedical Engineering, v28 n8 p568-573 Aug 81.

Blackman, et. al. have reported enhanced efflux of calcium ions from chicken forebrains, exposed in vitro in a 50 ohm stripline to 147 MHz radiation, modulated sinusoidally at 16 Hz. When the spacing between the sample tubes was 3.8 cm on center, enhancement occurred at an incident power density of 0.83 mW/cm, but not at 0.11, 0.55, 1.11, or 1.38 mW/sq cm. When the spacing between sample tubes was reduced to 1.9 cm, significant enhanced efflux was observed at incident power densities of 0.55, 0.83, 1.11, and 1.38 mW/sq cm. This broadening of the effective power-density range is explained herein by calculations which show that the more closely spaced samples interact electrically in a way that both lowers and broadens the range of spatial variation of absorbed power density (microwatt/cu cm) within the sample for a given incident power density (mW/sq cm). Electrical coupling among the samples allows several different values of incident power to yield exactly the same value of power absorber at given points within the brain sample. Because the absorbed power density must be directly related to the power that interacts with the brain to enhance the efflux of calcium ions, the electromagnetic conditions for efflux enhancement in coupled and uncoupled brains are the same if the absorbed power density is the same. Ranges of absorbed power density are identified that could be effective in enhancing the efflux of calcium ions from the brain tissue.

PB82-154915 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Experimental Biology Div.
Detection of Microwave Heating in 5-Hydroxytryptamine-Induced Hypothermic Mice.
Journal article,
R. J. Smialowicz, M. M. Riddle, P. L. Brugnolotti, R. R. Rogers, and K. L. Compton. 3 Apr 81, 12p EPA-600/J-81-513
Pub. in Radiation Research 88, p108-117 1981.

The intraperitoneal injection of 5-hydroxytryptamine (5-HT) in unrestrained and unanesthetized mice held at 22C causes a hypothermia which is maximal after approximately 15 minutes. When mice injected with 5-HT were held in a controlled environment of 22C and 50% relative humidity and exposed to microwaves (2450 MHz, cw) at 1 mW/sq cm for 15 minutes, significant increases were observed in the body temperature of these mice compared to 5-HT-treated sham-irradiated mice. The magnitude of the response was related to power density (10 > 5 > 1 mW/sq cm). Saline-injected mice exposed for 15 minutes at 10 mW/sq cm (specific absorption rate = 7.2 mW/g) showed no significant increase in body temperature compared to saline-injected sham-irradiated mice. The hypothermia induced by 5-HT in mice was also found to be affected by ambient temperature alone. Increases in ambient temperature above 22C, in the absence of microwaves, caused a concomitant increase in body temperature. By altering the thermoregulatory capacity of mice with 5-HT, subtle heating by microwaves was detected. These results indicate that the interpretation of microwave-induced biological effects observed in animals at comparable power and absorption levels should include a consideration of the thermogenic potential of microwave radiation.

PB82-935500 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Radiation Carcinogenesis.
Cancergram CK06.
1982, 12 issues
Supersedes PB81-935500.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The Cancergram deals with all aspects of radiation carcinogenesis. The term 'radiation' here includes U-V radiation and the entire electromagnetic spectrum, electron and other charged particle beams, neutrons, and alpha and beta radiation from radioactive substances. Abstracts included conern relationships between radiation and carcinogenesis in humans, experimental induction of tumors in animals by irradiation, studies on the mechanism of radiation carcinogenesis at the cellular level, studies of RBE, dose response or dose threshold in relation to radiation carcinogenesis, and methods and policies for control of radiation exposure in the general population. In general, this Cancergram excludes abstracts on radiotherapy, radiologic diagnosis, radiation pathology, and radiation biology, where these articles have no bearing on radiation carcinogenesis.

6S. Stress Physiology

AD-A108 996/0 PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
Nonauditory Effects of High Intensity Noise on Ground Crew at a Naval Air Station.
Interim rept.,
David J. Hord, and Mark A. Coultas. 1981, 19p Rept no. NAVHLTHRSCHC-81-27

Physiological, behavioral and subjective data were obtained from 14 ground crew considered possibly to be at risk for nonauditory effects of intense noise while working around jet aircraft. Fourteen matched control subjects working in normal noise environments were given the same test protocol. Brain stem evoked potentials, eye tracking behavior, balance, and nystagmus were compared between the groups and found to be nondiscriminating. In addition, subjective mood and perceived illness were compared and found to be the same in the two groups. It was concluded that ground crew wearing the required ear protection devices do not show nonauditory effects of intense noise encountered on their jobs, and that within the confines of the variables studied, no evidence exists that current safety measures and standards are inadequate. (Author)

AD-A109 127/1 MF **A01**
Singer Co., Binghamton, NY. Link Div.
Study and Design of High G Augmentation Devices for Flight Simulators.
Final rept.,
Gerald J. Kron, Frank M. Cardullo, and Laurence R. Young. Dec 81, 548p AFHRL-TP-80-41
Contract F33615-77-C-0055
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.
Availability: Microfiche copies only.

The physiological effects of accelerated flight are considered to contain perceptual information important to vehicle control and contribute to defining flight envelopes accessible to the pilot. As such, these effects, or acceptable surrogates thereof, must be considered for inclusion within ground-based devices designed to

train pilots for their flight mission. This study investigates the physiological effects of accelerated flight within the cardiovascular musculoskeletal, visual, auditory, tactile, and respiratory systems. The study advances conceptual designs of research-oriented devices thought capable of inducing, in the unaccelerated state, the perception of accelerated flight physiological effects. The authors conclude that one of the most important effects impacting vehicle control and successful mission execution is loss of visual acuity under accelerated flight conditions and propose a dual effect matrixed liquid crystal variable transparency visor to replicate this effect. A math model to simulate the effect is also presented. The study contains a bibliography of 277 references pertinent to accelerated flight physiological effects and equivalent simulation device design. The study presents an appendix containing an annotated bibliography of 133 references. (Author)

AD-A109 167/7 PC **A03**/MF **A01**
Karolinska Sjukhuset, Stockholm (Sweden). Lab. for Clinical Stress Research.
List of Publications 1980-1981.
1981, 28p
Text in English and Dutch.

No abstract available.

N82-14794/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Polyploidization Delay in Rat Hepatocytes under Liver Growth Inhibition by Hypokinesia.
V. M. Faktor, V. F. Malyutin, S. Y. Li, and V. Y. Brodskiy. Jul 81, 10p NASA-TM-76515
Contract NASW-3199
Transl. Into English from Tsitologiya (USSR), V. 21, No. 4, 1979 p 397-400.

A study of young rats, weighing 55 to 59 g, after being for 10 days in conditions of limited mobility, shows a retardation of body growth as well as that of liver growth. The decrease in the rate of growth is accompanied by a reduction of cell proliferation and by delay polyploidization of hepatocytes in the liver of experimental rats. The materials, methods, and results of research are discussed.

6T. Toxicology

AD-A109 088/5 PC **A02**/MF **A01**
Ohio State Univ. Research Foundation, Columbus.
Chemical and Molecular Biological Aspects of Alkylhydrazine-Induced Carcinogenesis in Human Cells in vitro.
Interim rept. 1 Sep 80-31 Aug 81,
Donald T. Witiak. Sep 81, 20p AFOSR-TR-81-0864
Contract F49620-80-C-0086

14C-labeled 1,1-DMH and 1,2-DMH of high specific activity (> or = 100 mCi/m mol) have been prepared and utilized, along with 14C-labeled MMH, to study alkylation of DNA and proteins in low passage human neonatal foreskin derived fibroblasts. When human fibroblasts were treated under conditions which would be expected to lead to a negligible number of transformation events, i.e. cells labeled were in a non-growing environment and the dose of methylhydrazine (1.6 microgram/ml) was well below the ED50 value (62-100 microgram/ml), significant differences in DNA and protein methylation were observed. For both protein and DNA, 1,2-DMH produced a higher degree of methylation than 1,1-DMH, with MMH demonstrating the lowest level. The relative quantity of 14CO2 released into the atmosphere above the treated fibroblast monolayers increased in order: MMH > 1,1-DMH > 1,2-DMH. The data suggests that in these cells there are significant differences in the metabolic and/or chemical transformation of the methylhydrazines in the proposed active metabolite, methyl diazonium ion. The majority of label in DNA isolated from cells treated with 1,2- and 1,1-DMH was found in the apurinic acid fraction. This was in contrast to that observed for MMH, when the majority of label was found in unmodified adenine (Ade) and guanine (Gua). Thus, in this latter case the carbon label appears to be more efficiently trapped in the 1-carbon pool than for the other methylhydrazines.

PB82-143231 PC **A02**/MF **A01**
Environmental Monitoring Systems Lab., Las Vegas, NV.
Effects of Lead on Benzene Metabolism.
Journal article,
J. E. Denton, G. D. Potter, and J. A. Santolucito. Dec 81, 10p EPA-600/J-80-049
Pub. in Jnl. of Toxicology and Environmental Health 7, p893-900 1981.

The possibility that Pb could affect benzene metabolism through inhibition of enzyme synthesis, was examined by studies of the effects of chronic oral Pb treatments on benzene conversion to phenol. Rats were given either distilled deionized water or 0.05, 0.58, 17 or 352 ppm Pb solutions as drinking water. After 6, 9, 12, and 15 wk of treatment, rats from each group were sacrificed and in vitro benzene metabolism by benzene hydroxylase was measured in liver enzyme preparations. After 24 wk, the remaining animals were injected ip with 400 mg/kg benzene and urinary phenol levels measured daily for 4 d. The enzyme activity, studied in vitro, was significantly increased in animals that ingested the 352 ppm solution for 6 wk. Also, Pb levels in all groups of animals were significantly higher in tissues from animals that ingested 352 ppm Pb. Although urinary phenol lvels accounted for 30-40% of the ip benzene dose, Pb ingestion had no significant effect on phenol excretion. These results suggested that oral Pb treatments had a significant effect on the enzyme responsible for benzene hydroxylation to phenol. However, unknown factors appear to compensate for these changes in vivo.

PB82-143298 PC **A02**/MF **A01**
Environmental Research Lab., Duluth, MN.
Environmental Acidification Impact Detection by Examination of Mature Fish Ovaries.
Journal article,
J. H. McCormick, G. N. Stokes, and G. J. Portele. Dec 80, 12p EPA-600/J-80-363
Pub. in Canadian Technical Report of Fisheries and Aquatic Sciences, n975, p41-48 1980. Proceedings of the Annual Aquatic Toxicity Workshop (6th) Held at Winnipeg, Manitoba on November 6-7, 1979. Sponsored in part by Department of Fisheries and Oceans, Winnipeg (Manitoba). Western Region.

Fathead minnow egg production and hatching success at pH 5.3 was scant to non-existent. Eggs spawned and incubated until hatching at pH 8.1 and 6.3 produced 39.7 and 5.7% normal larvae, respectively; eggs spawned at pH 6.3 incubated at 5.3 produced 0.5% normal larvae. Reproductive failure at pH 5.3 may have been predicted by ovarian histology. Ovaries of fathead minnows at pH 5.3 had exceptionally high proportions of pre-ovulatory corpora atretica relative to other oocyte stages present. The fathead minnow data were generated as a basis of extrapolation to estimate reproductive impairment in smallmouth bass inhabiting acid environments by examination of their ovarian condition.

PB82-151325 PC **A02**/MF **A01**
Northwestern Univ., Chicago, IL. Medical School.
Trace Anesthetic Effect on Perceptual, Cognitive and Motor Skills,
David L. Bruce, Mary Jean Bach, and Jack Arbit. 9 Jul 73, 20p
Contract PHS-HSM-99-72-48

Twenty males, paid volunteer medical or dental students were exposed on two occasions to four hours of inhalation of either air or 500 ppm nitrous oxide and 15 ppm halothane in air. Immediately following this, a battery of tests of perceptual cognitive and motor skills were administered to them. Evaluating their responses compared to their control conditions when they breathed only air, there was a significant decrement in performance following anesthetic exposure on a task of divided attention between auditory and visual signals, a visual tachistoscopic test, and memory tests involving digit span and recall of word pairs. These findings may indicate a subtle but significant negative effect on the ability of anesthesiologists to provide vigilant care for their patients. Further investigation of possible long-term effects upon the effective function and accident record of the anesthetist is indicated.

PB82-151697 PC **A02**/MF **A01**
Medical Coll. of Wisconsin, Inc., Milwaukee. Dept. of Environmental Medicine.
Pulmonary-Hematologic Studies on Humans during Exposure to Methylene Chloride,
Hubert V. Forster, Sally Graff, Carl L. Hake, Ricardo Soto, and Richard D. Stewart. Apr 74, 20p NIOSH-MCOW-ENVM-MC-74-4
Contract PHS-HSM-99-72-84

In order to determine whether daily exposure to methylene chloride (75092) vapors affects hemoglobin affinity for oxygen and/or pulmonary function, four healthy young males aged 22 to 24 years were exposed for 7-1/2 hours per day for 26 days in an environmental chamber over 6 consecutive weeks to various concentrations (0 to 50ppm) of methylene chloride vapor. Effects of the vapor on pulmonary airways, pulmonary gas exchange, the regulation of pulmonary ventilation and hemoglobin affinity for oxygen were examined. There was no perceptible effect on the first three categories, but the increased saturation of hemoglobin with carbon monoxide (124389) during exposure to methylene chloride did increase hemoglobin affinity for oxygen. There was no adaptation during exposures to restore hemoglobin affinity for oxygen to normal. Reproducibility of this method is plus or minus 5%.

PB82-151713 PC **A03**/MF **A01**
Medical Coll. of Wisconsin, Inc., Milwaukee. Dept. of Environmental Medicine.
Urinary Metabolites from Controlled Exposures of Humans to Trichloroethylene,
Carl. L. Hake, Richard D. Stewart, Jack E. Peterson, and Hugh C. Dodd. 7 May 73, 27p NIOSH-MCOW-ENVM-TCE-73-3
Contract PHS-HSM-99-72-84

The urinary metabolites of trichloroethylene (TCE) (79016), trichloroethanol (115208) and trichloroacetic acid (76039), were measured after humans had been exposed for controlled periods of time to either 20, 100 or 200ppm of TCE vapor for 5 days per week. The quantity and concentration of each metabolite varied widely during the daily exposures of identical magnitudes. If the excretion of either of these metabolites, or their sum, is to be considered as a measure of exposure, it must be remembered that at the current TLV, and at higher exposures, both the concentration and quantity are affected by previous recent exposures. At the lowest level of exposure studied the effect was lessened, indicating a better clearance of the metabolites on a daily basis. It is the conclusion that the measurement of urinary metabolites is not an ideal method of predicting the magnitude of a human exposure to the vapors of TCE, particularly if the exposure was near or greater than the current TLV.

PB82-151820 PC **A08**/MF **A01**
Utah Univ., Salt Lake City.
Respiratory Morbidity in Smelter Workers Study.
Final rept.,
C. Hilmon Castle. Jun 77, 164p
Contract PHS-HSM-99-72-134

An evaluation of the acute and chronic pulmonary effects of copper smelter exposure to sulfur dioxide (502) (7446095) and airborne particulates was conducted. The project was organized into two studies; a cross-sectional study and a prospective cohort study. All available smelter workers were tested by spirometry and a questionnaire to determine the prevalence of pulmonary function abnormalities and symptoms of respiratory diseases. All available workers at a truck maintenance shop, operated by the same company, were used as controls. Smelter workers as a group were slightly taller, older, had less education, smoked more, and included fewer nonwhites than the control group. There was an overall trend for the smelter workers to have a greater percentage of both borderline and chronic respiratory disease (from questionnaire responses) that the controls. The smelter workers had more days off work with illness than had controls. Spirometry data showed that FVC and FEV1 decreased with increasing amount of smoking, and with increasing amount of time spent in the smelter. The drop in age and height adjusted FEV1 with years spent at smelter jobs was most marked between the 0.1 to 9.9 and 10 to 19.9 year smelter groups averaging 9.2% for heavy smokers and 4.8% for nonsmokers. Significant reduction of FVC and FEV1 and a corresponding increase in some symptoms of respiratory disease, as well as days off for illness was found to be associated with chronic exposure to SO2 in the 8 hr time weighted average range of 1 to 5mg/cubic meter (0.4 to 2ppm) accompanied by small amounts of other sulfur oxides

and other particulates. This indicates a need for revising the occupational exposure standards for SO2.

PB82-152166 PC **A09**/MF **A01**
Medical Coll. of Wisconsin, Inc., Milwaukee. Dept. of Environmental Medicine.
Tetrachloroethylene: Development of a Biologic Standard for the Industrial Worker by Breath Analysis,
Richard D. Stewart, Carl L. Hake, Hubert V. Forster, Andre J. Lebrun, and Jack E. Peterson. 1981, 177p NIOSH-MCOW-ENVM-PCE-74-6
Contract PHS-HSM-99-72-84

The development of a biologic standard for exposure of industrial workers to tetrachloroethylene (PCE) (127184), based on breath analysis, was carried out in a comprehensive study using human volunteers. Particular emphasis was placed on: (1) the subject's health, including measurements of pulmonary, cardiovascular, and central nervous system functions during repeated, controlled exposures to PCE vapor; and (2) the relationship of exposure magnitude to PCE body burden, as demonstrated by the measurement of PCE or its metabolites in blood, urine and breath. A baseline is presented for additional studies which are needed to assure a healthful working environment wherever this chemical is utilized. The observations made and the data collected are provided, and a recommendation is presented for a biologic threshold-limit-value for tetrachloroethylene utilizing breath analysis decay curves. It is concluded that: (1) repeated daily exposure to PCE results in a tachyphylactic response regarding subjective feelings and odor detection, rendering these parameters unreliable as measures of exposure concentration; (2) considerable individual differences exist in response to PCE vapor exposure; (3) EEG analysis indicates preliminary signs of narcosis in most subjects exposed to 100 ppm PCE for 7 and one half hours; (4) CNS response is probably due to PCE; (5) postexposure breath analysis is an excellent method to estimate magnitude of body burden; and (6) physical exercise increases body burden.

PB82-152208 PC **A03**/MF **A01**
Hazleton Labs. America, Inc., Vienna, VA.
Inhalation Toxicity Study of Nitrous Oxide and Halothane in Rats.
Final rept.
24 Feb 77, 46p
Contract PHS-CDC-99-74-46

The mutagenic potential of long-term exposure of 120 male Sprague-Dawley rats to nitrous oxide is measured by observing aberrations in bone marrow cell chromosomes. Forty rats serve as controls, 40 are exposed to 50 ppm nitrous oxide plus 1 ppm halothane, and 40 are exposed to 500 ppm nitrous oxide plus 10 ppm halothane, for 7 hours a day, 5 days a week for 52 weeks. The most frequently found aberration is the chromatid gap. There is a significant increase in the number of gaps and this increase is dose-related. Chromatid breaks are the next most frequent aberrations observed. Chromosomal breaks are comparable among all groups. Chromosomal markers are significantly increased in the group receiving 500 ppm nitrous oxide. The incidence of polyploidy is comparable among control and treated groups. Fifty-nine percent of the animals in the first treatment group show aberrant cells; 68% in the second treatment group. It is concluded that exposure to 500 ppm nitrous oxide plus 10 ppm halothane can cause chromosomal damage to bone marrow cells in the rat.

PB82-152844 PC **A07**/MF **A01**
Medical Coll. of Wisconsin, Inc., Milwaukee. Dept. of Environmental Medicine.
p-Xylene: Development of a Biologic Standard for the Industrial Worker by Breath Analysis,
C. L. Hake, R. D. Stewart, A. Wu, S. A. Graff, and H. V. Forster. 1981, 148p NIOSH-MCOW-ENVM-XY-77-3
Contract PHS-HSM-99-72-84

Adults of both sexes were exposed to p-xylene (1330207) vapor concentrations of 0, 20, 100, and 150ppm for periods of 1, 3, and 7.5 hours in a controlled environment chamber for two purposes: (1) to develop a practical biologic test which could be used to limit the magnitude of an industrial exposure; and (2) to monitor the physiological response of healthy, sedentary adults to different vapor concentrations and durations of exposure. Repetitive vapor exposure to the current threshold limit value of 100ppm produced no serious subjective or objective health response in the 16 subjects, nor in eight male subjects who were exposed for 5 days to 150ppm p-xylene when 4 subjects exercised briefly while breathing 150ppm; however, the certainty and nature of this response requires confirmation. Analysis of methyl hippuric acid (495692) metabolite in 24 hr urine samples, and of p-xylene in postexposure blood, saliva, and breath samples all revealed the certainty of exposure to p-xylene vapor. For greatest practicality in routine biologic monitoring, and for establishing limits to p-xylene exposures in workers, it is recommended that breath sampling be carried out. An alveolar sample obtained 15 minutes after p-xylene exposure, should have p-xylene concentrations no greater than 4.5ppm in males or 3.5ppm in females. Concentrations below these limits indicate that workers had not been exposed to deleterious concentrations of p-xylene during the previous 8 hours.

PB82-152943 PC **A03**/MF **A01**
Connecticut Univ. Health Center, Farmington. School of Medicine.
Electromotive Interactions of Metals in Asbestos Carcinogenicity.
Final progress rept.,
F. William Sunderman. Oct 75, 46p
Contract PHS-HSM-99-72-24

An investigation into the carcinogenicity of metallic dusts, manganese (Mn) (749965), chromium (Cr) (7440473), aluminum (Al) (7429905), nickel sulfide (NiS) (1344496), nickel carbonyl (13463393), and iron carbonyl (13463406) was performed. Intrarenal (i.r.) injection of Ni3S2 (nickel subsulfate) (7786814) was found to induce erythrocytosis in Fischer rats. A single i.r. injection at 5 dosage levels from 0.6 to 10mg/rat caused erythrocytosis to develop reaching a maximum at 2 to 3 months. Blood erythrocyte counts returned to normal by 7 months. No significant changes occurred in leukocyte or platelet counts. Marked erythroid hyperplasia was present in bone marrow of rats that received i.r. Ni3S2, but not in controls or in rats that received i.m. Ni3S2. This study establishes the time response and dose response relationships for Ni3S2 induction of erythrocytosis in rats. Studies into the effects of Mn on tumorigenesis of Ni3S2 indicate that concurrent administration of Mn did not affect the local retention of Ni derived from Ni3S2. This study is consistent with the hypothesis that Mn may antagonize Ni (7440020) inhibition of RNA polymerase activity in rhabdomyocytes.

PB82-153867 PC **A02**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
Growth Characteristics of 'Vibrio parahaemolyticus',
Michael Johnson, and Mike Randolf. 1980, 16p
MASGP-80-026, NOAA-81111612
Grant NA80AA-D-00017
Prepared in cooperation with Mississippi State Univ., Mississippi State. Dept. of Biological Sciences.

Vibrio parahaemolyticus is a normal inhabitant of the coastal marine environment and may be seen associated with human disease as well as pathogenic conditions of fish and shellfish. This study was designed to consider only the effect of oil on survival of the bacteria under varying conditions of temperature and pH, as well as a crude assay on cytotoxicity of Vibrio toxin under in vitro testing conditions. Studies on the cytotoxicity of cell supernatants on mammalian cells indicates that both supernatants from 24 hour cultures are cytotoxic to mammalian cells under the conditions employed. If, in fact, the viable bacterial count is less in oil medium-grown cells, the cytotoxicity study indicates that a more potent toxicity for PK-15 cells exists in the supernatant from this culture. There is a clear indication that supernatants from cells grown in glucose-mineral salts medium, even though they are more resistent to heat inactivation, are less cytotoxic in vitro than parallel oil-grown cells. If conditions in the harvest areas result in higher levels of toxin production, the danger might be directly proportional to levels of hydrocarbons in the water. Such an observation could shed some light on the relationship between the foodborn illness in man and environmental conditions which enhance pathogenicity of the organisms.

PB82-154709 PC **A02**/MF **A01**
California Univ., Riverside. Statewide Air Pollution Research Center.
Protocol for Measuring the Relative Toxicity of Substances on Plant Foliage.
Journal article,
C. R. Thompson, Gerrit Kats, Philip W. Dawson, and Denise A. Doyle. 1981, 9p EPA-600/J-81-505
Grant EPA-R-806270
Pub. in Bull. Environm. Contam. Toxicol. 26, p281-287 1981.

Increasing numbers of synthetic chemicals and naturally occurring substances are being utilized in many newly developed processes and in so doing become part of our environment. To find out how these compounds may be affecting vegetation, a standard test was needed for comparative evaluation of these materials so that government control officials could comply with the recently enacted Toxic Substances Control Act. Presented here is a protocol describing a procedure to test the effects of a variety of toxic substances on standard test plants.

PB82-154774 PC **A02**/MF **A01**
North Carolina Univ. at Chapel Hill. School of Medicine.
Hazard of Lead Exposure in the Home from Recycled Automobile Storage Batteries.
Journal article,
Jack L. Dolcourt, Charles Finch, Gordon D. Coleman, Albert J. Klimas, and Christopher R. Milar. 18 Dec 80, 8p EPA-600/J-81-515
Pub. in Pediatrics, v68 n2 p225-229 Aug 81. Prepared in cooperation with Center for Disease Control, Atlanta, GA., North Carolina Dept. of Human Resources, Raleigh, New Hanover Memorial Hospital, Wilmington, NC., and Cabarrus County Health Dept., Concord, NC.

Two families from rural areas of North Carolina had excessive lead exposure which resulted from either recycling exhausted automobile storage batteries in the home or burning the discarded battery casings for home heating. One child developed encephalopathy resulting in permanent brain damage. Decontamination efforts reduced the quantity of lead in the home environment by >50%. Rural children, previously considered to be at low risk, may in fact receive profound exposures which may go unrecognized until encephalopathy occurs. Occupational histories should be obtained from parents in order to detect children at risk from environmental toxins brought into the home on workmen's bodies and clothing.

PB82-154808 PC **A03**/MF **A01**
Texas A and M Univ., College Station. Dept. of Biology.
The Ontogeny of Resistance Adaptation and Metabolic Compensation to Salinity and Temperature by the Caridean Shrimp, 'Palaemonetes pugio', and Modification by Sublethal Zinc Exposure,
Charles L. McKenney, Jr., and Jerry M. Neff. Jan 82, 38p EPA-600/D-82-140, ERL.GB-127
Grant NSF-ID075-04890
Pub. in Biological Monitoring of Marine Pollutants (Academic Press, Inc., NY), p205-240.

Changing patterns in survival and metabolic rates were measured during the complete larval development of the estuarine shrimp, Palaemonetes pugio, reared from hatch through metamorphosis in 9 combinations of salinity (7-31 degrees/ooS) and temperature (20-30C), both with and without exposure to a sublethal zinc concentration (0.23 ppm Zn). While early larval stages are extremely tolerant of a broad range of salinities and temperatures, late larval stages, beginning with the second to the last larval stage, are more sensitive to temperature than early larval stages. The most pronounced influence of sublethal zinc exposure on metabolic rates of developing larvae was a depression of the respiratory rates of the first stage, second from the last and the last larval stage under conditions of moderate to high temperatures in high salinities and in low salinity-temperature conditions.

PB82-154832 PC **A03**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Responses of Experimental Estuarine Communities to Continuous Chlorination.
Journal article,
Peter F. Sheridan, and Alston C. Badger. 2 Jan 81, 27p EPA-600/J-81-124
Pub. in Estuarine, Coastal and Shelf Science 13, p337-347 1981.

The effects of continuous chlorination (as NaOCl) on estuarine benthic organisms were investigated with plankton-derived experimental communities. Twelve consecutive studies were conducted, each of which consisted of approximately 60 days colonization periods from flowing estuarine waters continuously receiv-

ing nominal 0.00, 0.47, 0.94, or 1.41 mg/liter chlorine produced oxidant (CPO). Compared to controls, short-term (60 day) effects of chlorination included elimination of dominant species, replacement of one dominant species by another, and increased toxic effects correlated with extreme cold weather. Long-term effects (pooled over the 27 month study) included changes in the overall community composition and 40% reduction in numbers of individuals in communities receiving chlorine. Total numbers of species recorded were unaffected by chlorination.

PB82-154857 PC **A02**/MF **A01**
California Univ., Davis.
Morphological Effects of Prolonged Exposure to Ozone and Sulfuric Acid Aerosol on the Rat Lung.
Journal article,
P. F. Moore, and L. W. Schwartz. 5 Jan 81, 18p
EPA-600/J-81-519
Contract EPA-68-02-2496
Pub. in Experimental and Molecular Pathology 35, p108-123 1981.

The purpose of this study was to determine the pulmonary effects of a combination of ozone (0.5 ppm) and sulfuric acid aerosol (1 mg/cu. m.) and to assess the possibility of interactive effects. Groups of Sprague-Dawley rats were continously exposed to the pollutants, either individually or combined, for 3, 50, 90, or 180 days. After 180 days of exposure, additional groups breathed clean air for a further 62 days. Morphological evaluation included light microscopy, autoradiography, scanning electron microscopy (SEM), and transmission electron microscopy. Quantification of pulmonary centriacinar inflammatory cell response was performed by SEM. The results clearly demonstrated that exposure to 0.5 ppm ozone for 180 days resulted in a persistent inflammatory response in the pulmonary centriacinar region together with a structural modification of the terminal bronchiole - proximal alveolar duct junction. Sulfuric acid aerosol did not induce pulmonary morphological changes, nor did it potentiate lesions produced by simultaneous ozone exposure. After termination of the 62-day postexposure period, ozone and ozone plus sulfuric acid postexposure rats demonstrated a marked diminution in the intensity of the pulmonary centriacinar inflammatory response and a partial restoration of normal centriacinar structure.

PB82-154923 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Experimental Biology Div.
The Teratogenic Potential of Cacodylic Acid in the Rat and Mouse.
Journal article,
E. H. Rogers, N. Chernoff, and R. J. Kavlock. 1981, 14p EPA-600/J-81-512
Pub. in Drug and Chemical Toxicology 4(1), p49-61 1981.

Cacodylic acid, an organic arsenical herbicide, was administered to time-pregnant albino CD rats and CD-1 mice on days 7-16 of gestation. The compound was given by gastric intubation as a solution in distilled water. Rats received 0, 7.5, 15, 30, 40, 50, and 60 mg/kg/day in 0.2 ml/day intubation volume; mice received 0, 200, 400, or 600 mg/kg/day in 0.1 ml/day. Following maternal sacrifice on day 18 (mice) and 21 (rats), fetuses were weighed and fixed for skeletal and visceral examinations. Fetal and maternal toxicity was observed in both species. In the mouse, maternal toxicity was evident at the lowest dose, while teratogenic response was confined to cleft palate at 400 and 600 mg/kg/day. The effective maternal toxic dose in the rat was 40 mg/kg/day. In this species, incidence of irregular palatine rugae, i.e., ridges that were discontinuous and/or not lying in apposition at the palatal raphe, was significantly ($p < 0.001$) dose-related. The results suggest an 'apparent no effect level' for this anomaly below 30 mg/kg/day.

PB82-154980 PC **A02**/MF **A01**
Institut National de la Sante et de la Recherche Medicale, Paris (France).
Perspectives in Chronobiology of Air Pollution.
Journal article,
Maurice Stupfel, Franz Halberg, Medeleine Mordelet-Dambrine, and Monique Magnier. 10 Jan 77, 22p
EPA-600/J-88-184
Grant EPA-R-804512
Pub. in Chronobiologia, v4 n4 p333-351 Oct-Dec 77. Prepared in cooperation with Minnesota Univ., Minneapolis. Chronobiology Labs.

In a series of experiments, male and female Sprague Dawley rats, kept in light (L) from 06 time in hours to 18 time in hours alternating with darkness (LD 12:12) inhaled different concentrations of carbon monoxide (50-1,700 ppm) at each of two test times, 12h apart. A decrease in flow of CO2 (V co2) resulting from CO inhalation was greater in the active dark (D) than resting light (L) span. Experimental hypoxic mortality of male and female mice also shows circadian variations, being greater in the D than in the L span. Moreover, a difference of mortality was observed between hypoxic exposures performed at 12 time in hours (in LD or DL) and hypoxic exposures performed at 00 time in hours (in LD or DL). Such results await tests of any extent to which they model responses of human beings to air pollution. In human beings any external environmental circadian, circaseptan, and circannual variations in air pollution as such may serve to a variable extent as socioeconomic synchronizers of innate rhythms with a corresponding frequency, rather than as solely generators of time patterns in any physiopathologic response to air pollution.

PB82-158163 PC **A02**/MF **A01**
Alaska Univ., Fairbanks. Inst. of Marine Science.
Sublethal Effects of Chronic Oil Exposure on the Intertidal Clam 'Macoma balthica'.
Journal article,
M. S. Stekoll, L. E. Clement, and D. G. Shaw. Jan 82, 12p EPA-600/J-80-372
Grant EPA-R-803922
Pub. in Marine Biology 57, p51-60 1980.

When exposed to Prudhoe Bay crude oil in flowing seawater for 180 days, the small intertidal clam Macoma balthica showed behavioral, physical, physiological and biochemical changes. At a high concentration of oil in seawater (3.0 mg per l) burrowing rate decreased, respiration rate increased, growth was inhibited, and very high mortalities resulted. The lowest concentration of oil in seawater (0.03 mg per l) inhibited growth and caused reabsorption of gametes. One group of adverse oil effects which was related to sluggishness and disorientation of the clams appeared after a week of exposure to oil; another group related to a negative energy balance was not observed until 60 days. The authors conclude that chronic exposure of M. balthica to oil-in-seawater concentrations even as low as 0.03 mg per l will, in time, lead to population decreases.

PB82-160532
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
Introduction, General Findings and General Recommendations,
Lars Friberg, Norton Nelson, Jay Beaumont, Bruce A. Fowler, and Robert Lauwerys. 1980, 30p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p1-30 1980.

No abstract available.

PB82-160540
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
Problems of Epidemiological Evidence,
Richard Doll, Lawrence Fishbein, Peter Infante, Philip Landrigan, and J. William Lloyd. 1980, 40p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p31-72 1980.

No abstract available.

PB82-160557
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
Experimental Studies in Whole Animal Bioassay,
Thomas Clarkson, Robert A. Goyer, Gerald L. Fisher, Arthur Furst, and George Kazantzis. 1980, 19p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p73-91 1980.

No abstract available.

PB82-160565
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
Chemistry and Metabolism of Metals Relevant to Their Carcinogenicity,
Arthur E. Martell, Maths Berlin, George Brubaker, Gunther L. Eichhorn, and David Groth. 1980, 27p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p92-118 1980.

No abstract available.

PB82-160573
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
In vitro Models and Methods for Bioassay and Studies of Cellular Mechanisms,
Sidney Belman, Bruce Casto, C. Peter Flessel, Bernard P. Lane, and Lawrence Loeb. 1980, 28p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p119-146 1980.

No abstract available.

PB82-160581
(Order as PB82-160524, PC **A99**/MF **A01**)
National Center for Toxicological Research, Jefferson, AR.
Sources, Transport and Alterations of Metal Compounds: An Overview I. Arsenic, Beryllium, Cadmium, Chromium and Nickel,
Lawrence Fishbein. 1980, 69p
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p147-216 1980.

No abstract available.

PB82-160599
(Order as PB82-160524, PC **A99**/MF **A01**)
Umea Univ. (Sweden). Dept. of Environmental Hygiene.
Metal Interactions in Carcinogenesis: Enhancement, Inhibition,
Gunnar F. Nordberg, and Ole Andersen. 1980, 47p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH. Prepared in cooperation with Odense Univ. (Denmark).
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p217-263 1980.

No abstract available.

PB82-160607
(Order as PB82-160524, PC **A99**/MF **A01**)
San Francisco Univ., CA. Inst. of Chemical Biology.
Bioassay of Metals for Carcinogenesis - Whole Animals,
Arthur Furst. 1980, 34p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p264-298 1980.

No abstract available.

PB82-160615
(Order as PB82-160524, PC **A99**/MF **A01**)
Karolinska Inst., Stockholm (Sweden). Dept. of Environmental Hygiene.
The Carcinogenicity of Arsenic,
Goeran Pershagen. 1980, 39p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p299-337 1980.

No abstract available.

PB82-160623
(Order as PB82-160524, PC **A99**/MF **A01**)
State Univ. of New York at Stony Brook.
The Carcinogenicity of Beryllium,
Marvin Kuschner. 1980, 18p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p338-355 1980.

No abstract available.

PB82-160631
(Order as PB82-160524, PC **A99**/MF **A01**)
Karolinska Inst., Stockholm (Sweden). Dept. of Environmental Hygiene.
The Role of Cadmium in Carcinogenesis - With Special Reference to Cancer of the Prostate,
Magnus Piscator. 1980, 54p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH. Prepared in cooperation with National Inst. of Environmental Medicine, Stockholm (Sweden).
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p356-409 1980.

No abstract available.

PB82-160649
(Order as PB82-160524, PC **A99**/MF **A01**)
Institute of Occupational Health, Oslo (Norway).
The Carcinogenicity of Chromium,
Tor Norseth. 1980, 41p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p410-450 1980.

No abstract available.

PB82-160656
(Order as PB82-160524, PC **A99**/MF **A01**)
Connecticut Univ. Health Center, Farmington. School of Medicine.
Recent Research on Nickel Carcinogenesis,
F. William Sunderman, Jr. 1980, 37p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p451-487 1980.

No abstract available.

PB82-160664
(Order as PB82-160524, PC **A99**/MF **A01**)
London School of Hygiene and Tropical Medicine (England).
The Role of Cobalt, Iron, Lead, Manganese, Mercury, Platinum, Selenium and Titanium in Carcinogenesis,
George Kazantzis. 1980, 57p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p488-543 1980.

No abstract available.

PB82-160672
(Order as PB82-160524, PC **A99**/MF **A01**)
Temple Univ., Philadelphia, PA.
Effects of Metals in In vitro Bioassays,
Michael A. Sirover. 1980, 34p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p544-577 1980.

No abstract available.

PB82-160680
(Order as PB82-160524, PC **A99**/MF **A01**)
Institute of Occupational Health, Helsinki (Finland). Dept. of Industrial Hygiene and Toxicology.
Chromosome Aberrations and their Relevance to Metal Carcinogenesis,
H. Vainio, and M. Sorsa. 1980, 32p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p578-609 1980.

No abstract available.

PB82-160698
(Order as PB82-160524, PC **A99**/MF **A01**)
National Inst. of Environmental Health Sciences, Research Triangle Park, NC.
The Relationship Between Metal Toxicity to Subcellular Systems and the Carcinogenic Response,
K. S. Squibb, and B. A. Fowler. 1980, 27p
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p610-636 1980.

No abstract available.

PB82-160706
(Order as PB82-160524, PC **A99**/MF **A01**)
New York Univ., NY. Inst. of Environmental Medicine.
Effect of Metals on Mutagenesis and DNA Repair,
Toby G. Rossman. 1980, 26p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p637-663 1980.

No abstract available.

PB82-160714
(Order as PB82-160524, PC **A99**/MF **A01**)
Washington Univ., Seattle.
Metal Induced Infidelity of DNA Synthesis,
Richard A. Zakour, Thomas A. Kunkel, and Lawrence A. Loeb. 1980, 30p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p664-692 1980.

No abstract available.

PB82-160730
(Order as PB82-160524, PC **A99**/MF **A01**)
Maryland Univ. Baltimore County, Baltimore.
Chelating Agents in Biological Systems,
Jack Schubert. 1980, 21p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p742-762 1980.

No abstract available.

PB82-160748
(Order as PB82-160524, PC **A99**/MF **A01**)
Dartmouth Coll., Hanover, NH. Dept. of Chemistry.
The Role of Metals in Carcinogenesis: Biochemistry and Metabolism,
K. W. Jennette. 1980, 64p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p763-827 1980.

No abstract available.

PB82-932300 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Antitumor and Antiviral Agents: Experimental Therapeutics, Toxicology, Pharmacology.
Cancergram CB20.
1982, 12 issues
Supersedes PB81-932300.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This Cancergram concentrates on the effectiveness of chemical agents and preparations in controlling tumor growth, metastasis, and viruses associated with tumors. These agents include substances undergoing initial testing for efficacy as well as established antitumor drugs currently being used in new treatment regimens. The Cancergram covers in vivo and in vitro testing of animals and animal cell lines, and in vitro exposure of human cell lines to these agents. In keeping with the preclinical orientation of this Cancergram, studies involving the administration of drugs to patients for the establishment of clinical treatment protocols are excluded. Emphasis is placed on dose-response and biological activity studies, establishment of lethal and toxic dose levels, the comparative toxicity and efficacy of agents used independently, and the potentiating or antagonistic interactions of agents used in combination. Biochemical and physiological aspects of the actions and metabolism of antitumor agents are not in scope; these topics are covered in Cancergram CB19, entitled Antitumor and Antiviral Agents--Mechanisms of Action.

PB82-935100 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Chemical Carcinogenesis: Nitroso Compounds.
Cancergram CK01.
1982, 12 issues
Supersedes PB81-935100.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

This agent-oriented Cancergram covers all information on nitroso compounds that might be relevant to research on the carcinogenicity of these compounds, or to judgments concerning the possible public hazards of these compounds or their precursors. Abstracts included concern induction of neoplasms by nitroso compounds; formation, biochemistry, cellular effects, and mutagenicity of nitroso compounds; reviews including nitroso compounds; and analytical methods for nitroso compounds. The Cancergram generally excludes all material on the properties of the nitrosourea compounds used in cancer therapy.

PB82-935600 Subscription
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Chemical Carcinogenesis: Polycyclic Aromatic Hydrocarbons, and Related Compounds.
Cancergram CK07.
1982, 12 issues
Supersedes PB81-935600.
Paper copy available on subscription, North American Continent price $24.00/year; all others write for quote. Also available in single copies.

The agent-oriented Cancergram deals with the carcinogenicity of polycyclic aromatic hydrocarbons and of certain related nitrogen-heterocyclic analogs having similar mechanisms of carcinogenesis and similar occurrences in the environment. The Cancergram covers carcinogenicity and modification of carcinogenicity, activation and metabolism, macromolecular binding, cellular effects and lesions, mutagenicity and in vitro testing, and analytical methods for the compounds and their derivatives. It also includes formation, occurrence in the environment, and various aspects of human exposure to these compounds. The Cancergram excludes studies where polycyclic aromatic hydrocarbons have been used simply as a tool to induce experimental tumors for other studies. Also excluded are heterocyclic hydrocarbons of nonenvironmental origin (such as drugs) or which act through a carcinogenic mechanism markedly different from that of the polycyclic aromatic hydrocarbons.

7.

CHEMISTRY

7A. Chemical Engineering

AD-A109 346/7 Not available NTIS
Wisconsin Univ.-Madison.
The Effect of Activation Energy on Tubular Reactor Multiplicity,
Robert F. Heinemann, and Aubrey B. Poore. 21 Jan 81, 3p ARO-16415.72-M
Contract DAAG29-80-C-0041
Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Mathematics.
Availability: Pub. in Chemical Engineering Science, v37 n1 p128-131 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 350/9 Not available NTIS
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mathematical Sciences.
The Steady Response of a Nonadiabatic Tubular Reactor, New Multiplicities,
A. K. Kapila, and Aubrey B. Poore. 19 Nov 80, 13p ARO-14063.22-M
Grant DAAG29-76-G-0315
Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Mathematics.
Availability: Pub. in Chemical Engineering Science, v37 n1 p57-68 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

DE81029749 PC **A08**/MF **A01**
AiResearch Mfg. Co. of California, Torrance.
Brayton-Cycle Solvent Recovery System. Phase 1. System Optimization.
16 Jun 80, 161p DOE/CS/40005-T4
Contract AC03-78CS40005

The findings of an investigation on potential use of the Braton-cycle for solvent recovery are discussed. Section 3 describes the basic Brayton cycle principle and the various methods of recovering solvents. The presently used solvent recovery systems of carbon and condensation by mechanical refrigeration are described and incineration is discussed as an alternate method to reduce solvent emissions to the atmosphere. Candidate Brayton-cycle systems selected for further evaluation are depressed freezing (closed loop); desiccant (open loop); and carbon desorb. The potential industrial applications for the candidate Brayton-cycle concepts and the market potential that could be expected are described in Section 4. All industries that manufacture, market, synthesize, process, coat, or clean with volatile organics were considered. An economic analysis in Section 5 of the candidate solvent recovery systems shows that the cost of incorporating any of the systems can be justified on the basis of the payback value of the recovered solvent. The method of conducting site surveys is discussed. The 3M tape coating facility located in Hutchinson, Minnesota, was chosen as the demonstration site. Results of recovering solvents from one or another oven zones using the closed loop Brayton-cycle solvent recovery system are detailed. (ERA citation 06:035084)

PB82-141235 PC **A05**/MF **A01**
Centro Nacional de Productividad, San Salvador (El Salvador).
Bio-gas in El Salvador; Specialist, Projects and Stage of Development (Bio-gas en El Salvador; Especialistas aus Proyector y Grado de Avance),
Moises H. Vides Oliva. Nov 80, 84p
Text in Spanish and English.

Results from tests on bio-gas production that were carried out at a laboratory level in El Salvador were put into practice for the production of energy in that country, in a project started in June, 1980. This document deals with the projects, either already accomplished or in progress, their locations, technical operations, and basic sources of bio-gas. The bibliography supplied is a combined list provided by each technician in the various projects. An annex is presented on projects of alternative sources of energy.

PB82-153321 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Modelling of Oil Shale Retorts for Electromagnetic Sensing Techniques.
Final rept.,
H. Chew. Nov 81, 48p NBSIR-81-1653
Sponsored in part by Department of Energy, Washington, DC.

Work is reported on the modelling of oil shale retorts for electromagnetic sensing techniques. The aim is to obtain useful information about the contents of the retort (e.g., rubble size, void ratio, etc.) by means of electromagnetic probes. In this work, the retort is modelled by a spheroid with an average dielectric constant which depends on the void ratio. The near field due to a radiating dipole source in the vicinity of a spheroidal retort is computed using the Extended Boundary Condition Method due to Waterman, Barber, and Yeh. Numerical results are given at 4 MHz for a retort with major axis 45.7 (150 ft), minor axis 25.1 m (82.5 ft), bulk dielectric constant 8.8 + 3.7, and various void ratios. The results indicate feasibility of determining the void ratio by remote electromagnetic measurements. It is also believed that this work may be of interest beyond the immediate context of oil shale retort modelling.

PB82-153560 PC **A06**/MF **A01**
Schroeder Process Corp., Santa Ana, CA.
Operating Characteristics of Various Combinations of Working Substances and Feeds in the Schroeder Desalting Process.
Final rept.
Jul 81, 125p W82-02105, OWRT-C-00135-S(0450)(1)
Contract DI-14-34-001-0450
Color illustrations reproduced in black and white.

A novel process has been discovered which has the potential to combine the advantages of both distillation and freezing processes, without the disadvantages. The process uses a working substance (WS), such as a high melting organic compound, at its freezing point, to effect direct contact evaporation. The purpose of this project was to investigate the operating characteristics of various WSs in the laboratory and a bench scale plant (BSP). A WS screening program tested melting range, solubility, tendency to entrain or emulsify, and stability, in the laboratory program. The BSP program satisfactorily simulated the operation of major pieces of equipment, using WSs that passed the screening program with seawater, and other saline water feeds. The process is ready for pilot plant design, construction, and operation.

PB82-803958 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrostatic Precipitators. 1979-1981 (Citations from the NTIS Data Base).
Jan 82, 181p
Supersedes PB80-815541, and NTIS/PS-79/1034.

Citations of Federally-funded research are presented on the design, performance, theory, and applications of electrostatic precipitators for use in air pollution control. Both industrial and electric power plants are included. (This updated bibliography contains 174 citations 80 of which are new entries to the previous edition.)

PB82-804014 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ozonization Used in Water and Sewage Treatment. 1970-1981 (Citations from the NTIS Data Base).
Jan 82, 193p
Supersedes PB80-815616, and NTIS/PS-79/1042.

The bibliography cites Federally-funded research in the use of ozone to treat industrial waste water, sewage, and drinking water. It discusses treatment, tests, performance of equipment, and effectiveness of ozone in water pollution control (This updated bibliography contains 186 citations, 33 of which are new entries to the previous edition.)

7B. Inorganic Chemistry

AD-A109 354/1 Not available NTIS
Utah Univ., Salt Lake City. Dept. of Chemistry.
Deprotonation of Pentaborane (9) with Solid Potassium Hydroxide,
Mansel A. Nelson, and Goji Kodama. 21 Apr 81, 3p
ARO-16243.7-C
Contract DAAG29-79-C-0129, Grant DAAG29-76-G-0120
Availability: Pub. in Inorganic Chemistry, v20 p3579-3580 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-160722
(Order as PB82-160524, PC **A99**/MF **A01**)
Texas A and M Univ., College Station. Dept. of Chemistry.
The Chemistry of Carcinogenic Metals,
Arthur E. Martell. 1980, 49p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.
Included in Proceedings of a Workshop/Conference of the Role of Metals in Carcinogenesis, p693-741 1980.

No abstract available.

7C. Organic Chemistry

AD-A109 333/5 PC **A02**/MF **A01**
State Univ. of New York at Buffalo. Dept. of Chemistry.
The Attempted Syntheses of Low Oxidation State, Organometallic Derivatives of Aluminum, Gallium and Indium, a New Synthesis of Al(CH2SiMe3)3.
Technical rept.,
O. T. Beachley, Jr., C. Tessier-Youngs, R. G. Simmons, and R. B. Hallock. 19 Mar 81, 20p Rept no. TR-8
Contract N00014-78-C-0562

The synthesis of KAl(CH2SiMe3)2 by a reductive elimination reaction between Al(CH2SiMe3)3 and KH has been attempted but a pure product could not be isolated. The reactants combine at 70 C to form KAl(CH2SiMe3)3H, a white pyrophoric solid, which has been fully characterized. A molecular weight study indicates the presence of a mixture of monomeric and dimeric species in benzene solution. The pyrolysis of KAl(CH2SiMe3)3H at 205 C produces Si(CH3)4 but also CH4. The formation of Si(CH3)4 suggests that KAl(CH2SiMe3)2 might have been formed but the presence of CH4 indicates that a decomposition reaction occurs either prior to or after the formation of KAl(CH2SiMe3)2. The reactions of mixtures of KH-Al(CH3)3, KH-Ga(CH3)3, NaH-Ga(CH3)3, KH-In(CH3)3 and NaH-In(CH3)3 have also been investigated in order to determine the role of the organic substituent in the attempted reductive elimination reactions. In all cases the formation of CH4 during pyrolysis of KAl(CH3)H, KGa(CH3)3H and the other reaction mixtures is consistent with the occurrence of reduction but no pure compounds could be isolated. A new synthetic route to Al(CH2SiMe3)3 from AlBr3 and LiCH2SiMe3 in refluxing hexane is also described. (Author)

AD-A109 384/8 PC **A03**/MF **A01**
Virginia Univ., Charlottesville. Dept. of Chemistry.
Boranametallacarboranes. 1. Synthesis and Characterization of (Borane) Cobalt (Carborane) Sandwich Complexes.
Interim rept.,
Lester Borodinsky, and Russell N. Grimes. Dec 81, 41p Rept no. TR-39
Contract N00014-75-C-0305

The first known examples of borane-metal-carborane sandwich complexes, in which a metal atom simultaneously occupies vertices in a metallaborane and a metallacarborane framework, have been obtained from reactions of B5H8- or B9H14- ions with CoCl2 in THF, followed by addition of R2C2B4H5- ion (R = CH3 or C2H5). With B5H8- and (C2H5)2C2B4H5-, the characterized products are (2,3-(C2H5)2C2B4H4)-2-Co-(B5H10) (I), (2,3-(C2H5)2C2B4H4)-5-Co(B9H12-1-0(CH2)4) (II), and (2,3-(C2H5)2C2B3H5)-5-Co(B9H12-1-0(CH2)4) (III). With B9H14- as the borane reagent, the products are (2,3-(C2H5)2C2B3H5)-6-Co-(B9H12-2-0(CH2)4) (IV) and (1,2-(C2H5)2C2B7H7)-6-Co-(B9H12-2-0(CH2)4) (V), as well as traces of I, II, and III. Except for I, an orange oil, all products are crystalline solids.

N82-14310/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Reactivity of Pyrylium Salts Toward Basic Reactants.
R. Neidlein, and P. Witerzens. Aug 81, 16p NASA-TM-76675
Contract NASW-3199
Transl. Into English from Archiv der Pharmacie (Weinheim), No. 309, 1976 p 649-660. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

The reactivity of some N-acyl and N-sulfonyl-hydrazines 2-4, 10a-10g, 12, 13, 16a, 16b and of hydrazones 18, benzyldihydrazone 21 towards pyrylium salts 1 was examined. By reaction of 2,4,6-trimethyl-pyrylium salt 1 with substituted hydrazines some pyridinium salts were obtained. Relationships between basicity and reactivity were discussed.

7D. Physical Chemistry

AD-A108 843/4 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Weak and Strong Ignition. II. Sensitivity of the Hydrogen-Oxygen System.
Memorandum rept.,
E. S. Oran, and J. P. Boris. 7 Dec 81, 39p Rept no. NRL-MR-4671

This paper identifies the physical and chemical mechanisms which cause certain mixtures of hydrogen, oxygen and argon to be very sensitive to sound wave or entropy (temperature) perturbations. Detailed simulations of the effects of sound waves in typical mixtures are used to show explicity the effects of such fluctuations on the chemical induction time. A quantity

delta TAU max, is defined which represents the maximum variation produced in the chemical induction time of a system given the amplitude and frequency of a perturbation. It is observed that these perturbations may cause ignition to occur unevenly in such mixtures and this leads to ignition which appears spotty. Using detailed numerical simulations and a generalized induction parameter model derived from it, delta TAU max is evaluated and a criterion is developed for spotty and smooth ignition behind reflected shock waves. These effects are related to weak and strong ignition observed in shock tube experiments. (Author)

AD-A108 858/2 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
On the Frequency Factor in Electron Transfer Reactions and Its Role in the Highly Exothermic Regime.
Technical rept.,
R. A. Marcus. 3 Nov 80, 10p Rept no. TR-11
Contract N00014-79-C-0009
Pub. in International Jnl. of Chemical Kinetics, v13 p865-872 1981.

No abstract available.

AD-A108 931/7 PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Chemistry.
Single Collision Gas-Surface Vibrational Energy Transfer In Reactive Systems. Variation of Initial Energy Distribution.
Technical rept.,
R. Arakawa, D. F. Kelley, and B. S. Rabinovitch. 25 Nov 81, 25p
Contract N00014-75-C-0690

The initial vibrational energy distribution of molecules that collide with a hot surface has been varied. The effect on the collisional reaction probability has been studied under single collision conditions. These experiments provide a more sensitive test of the relative suitability of various analytical forms for the collisional transition probability matrix, (CTPM). The reaction system is the isomerization of cyclobutene to 1,3 butadiene. A seasoned fused quartz surface was used over the temperature range 600 K - 900 K. Variation of the initial vibrational energy population vector of cyclobutene molecules was made by change of their initial temperature in the range 273 K - 620 K. Gaussian or Boltzmann exponential forms of (CTPM) prove to be the most suitable to fit the data.

AD-A108 981/2 PC **A02**/MF **A01**
Colorado Univ. at Boulder.
Laser Spectroscopy of Solid State Electrolytes.
Final rept. 1 Oct 76-30 Sep 81,
James F. Scott. 9 Dec 81, 6p AFOSR-TR-81-0862
Grant AFOSR-77-3105

Optical spectroscopy and electrical and thermal measurements are described on the solid state electrolytes ('superionic conductors') such as silver tungstate and related compounds. (Author)

AD-A108 991/1 PC **A02**/MF **A01**
EIC Labs., Inc., Newton, MA.
An IR Sensitive, Real-Time Imaging Technique Based on a Photoelectrochemical Cell.
Technical rept.,
Ronald H. Micheels, and R. David Rauh. Dec 81, 19p Rept no. TR-3
Contract N00014-79-C-0700

A real-time imaging technique based on optical saturation phenomena in photoelectrochemical cells has been developed. The long wavelength spectral sensitivity of these devices extends to the bandgap energy of the semiconductor photoelectrode employed. An image resolution of 180 microns and a response time of better than 100 msec has been obtained with an n-GaAs cell. (Author)

AD-A109 014/1 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
Collinear Quantum Mechanical Probabilities for the I + HI Yields IH + I Reaction using Hyperspherical Coordinates,
Jack A. Kaye, and Aron Kuppermann. 24 Oct 80, 8p CONTRIB-6056, AFOSR-TR-81-0832
Contract F49620-79-C-0187, Grant NSF-CHE78-20235
Pub. in Chemical Physics Letters v77 n3 p573-579, 1 Feb 81.

No abstract available.

AD-A109 015/8 PC **A02**/MF **A01**
University Chemical Labs., Cambridge (England). Dept. of Physical Chemistry.
Relaxation of NO(v = 1) by Radical Species,
Rohantha P. Fernando, and Ian W. M. Smith. 16 Apr 80, 11p AFOSR-TR-81-0813
Grant AFOSR-77-3240
Pub. in Jnl. of Chemical Society, Faraday Trans., v2 p459-468 1981.

No abstract available.

AD-A109 018/2 PC **A05**/MF **A01**
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
Accurate Quantum Calculations of Reactive Systems,
Aron Kuppermann. 1981, 85p AFOSR-TR-81-0830
Contract F49620-79-C-0187
Pub. in Theoretical Chemistry: Theory of Scattering, v6 ptA p79-164 1981.

No abstract available.

AD-A109 025/7 PC **A02**/MF **A01**
Rochester Univ., NY. Dept. of Chemistry.
On the Synergistic Effects of Laser/Phonon-Stimulated Processes: A Master Equation Approach.
Technical rept.,
Jui-teng Lin, and Thomas F. George. Dec 81, 17p Rept no. TR-16
Contract N00014-80-C-0472

The synergistic effects of an adspecies/surface system influenced by a coherent laser field and an incoherent thermal phonon field are theoretically investigated. A generalized master equation is derived in the Schrodinger-Markoff picture and the total stimulated transition rates are decomposed into three parts: thermal phonon, laser and the interference terms. The energy transfer dynamics is pictured via the evolution equation of the average excitation of the active mode. A random phase of the off-diagonal matrix elements induced by the laser-stimulated surface processes is introduced. Finally, possible applications of the laser/phonon-stimulated master equation are discussed. (Author)

AD-A109 040/6 PC **A02**/MF **A01**
Williams Coll., Williamstown, MA. Dept. of Physics.
Resonance Studies of Hydrogen Atoms Interacting with Very Cold Surfaces.
Annual summary rept. 1 Mar 81-28 Feb 82,
Stuart B. Crampton. 16 Dec 81, 8p Rept no. SBCONR2
Contract N00014-80-C-0240

Experimental techniques and theoretical methods of analysis for the study of hydrogen atoms stored in containers having very cold surfaces are developed. The temperature dependence of the probability of adsorption and average time of adsorption of hydrogen atoms on frozen molecular hydrogen surfaces is measured. Recombination and other relaxations while adsorbed are studied. A high intensity state-selected hydrogen atom beam with thermal speeds at 6 K is developed and applied to atomic hydrogen maser development. (Author)

AD-A109 051/3 PC **A03**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Chemistry.
Electron Exchange between Bis(eta(6)-Arene) Chromium(I) and Bis(eta(6)-Arene) Chromium(O). Comparisons between Experimental and Calculated Kinetics Parameters.
Technical rept.,
Tomi T-T. Li, Michael J. Weaver, and Carl H. Brubaker, Jr. 15 Dec 81, 26p Rept no. TR-7
Contract N00014-79-C-0670

Comparisons have been made between kinetics parameters for the self exchange of (eta(6)-arene)2Cr(I)/(eta(6)-arene)2Cr(O) (where arene = benzene, toluene, methoxylbenzene, biphenyl, ethylbenzoate and chlorobezene) measured by ESR line broadening in dimethylsulfoxide, with the predictions from contemporary electron-transfer theory. The biphenyl system was additionally studied in a number of other solvents. These reactions provide especially tractable systems with which to test theories of outer-sphere electron transfer since the work terms should be essentially zero, and the inner-shell contributions. Delta G to the free energy barrier are small and can be estimated from infra-red spectroscopy combined with crystallographic data. These were found to be somewhat (ca. 5-20 fold) larger than the corresponding frequency factors derived from the experimental activation enthalpies combined wtih the dielectric continuum estimates of the activation entropies. These 'experimental' frequency factors are compared with the estimates obtained from the 'reactive collision' and the 'ion-pair pre-equilibrium' models. The majority of the experimental frequency factors were found to be numerically closer to the predictions of the former model.

AD-A109 060/4 PC **A02**/MF **A01**
George Washington Univ., Washington, DC. School of Engineering and Applied Science.
Multiangular Scanning Absorption-Emission Techniques for Three Dimensional Combustion Diagnostics.
Annual rept. 1 Sep 80-30 Aug 81,
Robert Goulard. 1 Dec 81, 14p AFOSR-TR-81-0857
Grant AFOSR-77-3439

This program explores the potential of absorption techniques for low ppm, real time 3-dimensional combustion diagnostics. IN the current phase of activity, a laser beam has been transformed into a sheet of light and made to converge on a 126-element array, with electronics suitable for repeatable 1.5 KHz scanning and data processing. Available memory modules (4K) allow for 34 successive slicings of a passing target within 20 milliseconds. In this manner, a detailed projection of three-dimensional flow field concentrations is available. An axisymmetrical flow (tobacco smoke rings) has been measured and a tomographic procedure was applied to these data. Better ranges of absorption are being considered and multiangular experiments (non-symmetrical cases) will follow. The construction of a portable tomographic unit is also in progress. It was upgraded to nonsteady flow capabilities by coupling a CAMAC digitizer with a MINC minicomputer. The source and sensor part of the experiment have been completed. Data processing and flow controls will follow. A theoretical review of flow instabilities is underway. Existing qualitative work suggests three-dimensional patterns for which this tomographic approach is ideally suited. (Author)

AD-A109 061/2 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
An Experimental and Theoretical Investigation of the Mechanism of Deoxygenation of Carbonyl Compounds by Atomic Carbon.
Interim rept.,
Michael J. S. Dewar, Donna J. Nelson, Philip B. Shevlin, and Keith A. Biesiada. 18 Aug 80, 8p AFOSR-TR-81-0820
Grant AFOSR-79-0008
Pub. in Jnl. of the American Chemical Society, v103 n10 p2802-2807 1981.

No abstract available.

AD-A109 064/6 PC **A02**/MF **A01**
University Chemical Labs., Cambridge (England). Dept. of Physical Chemistry.
Vibrational Energy Transfer between HCN and DCN and Hydrogen and Deuterium Halides,
Graham S. Arnold, Rohantha P. Fernando, and Ian W. M. Smith. 7 May 80, 8p AFOSR-TR-81-0812
Grant AFOSR-77-3240
Pub. in Jnl. of Chemical Physics, v73 n6 p2773-2779, 15 Sep 80.

No abstract available.

AD-A109 065/3 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
Quantum Mechanical Coupled-Channel Collision-Induced Dissociation Calculations with Hyperspherical Coordinates,
Jack A. Kaye, and Aron Kuppermann. 2 Dec 80, 7p CONTRIB-6302, AFOSR-TR-81-0831
Contract F49620-79-C-0187
Pub. in Chemical Physics Letters, v78 n3 p546-551, 15 Mar 81.

No abstract available.

AD-A109 066/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.

Laser Spectroscopy of CaBr:A(2)Pi-X(2)Sigma(+) and B(2)Sigma(+)-X(2)Sigma(+) Systems,
P. F. Bernath, R. W. Field, B. Pinchemel, Y. Lefebvre, and J. Schamps. 13 Nov 80, 21p AFOSR-TR-81-0828
Grant AFOSR-76-3056
Pub. in Jnl. of Molecular Spectroscopy, v88 p175-193 1981.

No abstract available.

AD-A109 067/9 PC **A02**/MF **A01**
Chicago Univ., IL. James Franck Inst.
Atom-Diatomic Molecule Collisions at Very Low Energies. 1. A Computational Study of the Adiabatic and Effective Potential Approximations,
V. Sethuraman, and Stuart A. Rice. 17 Mar 81, 14p AFOSR-TR-81-0823
Grant AFOSR-81-0029
Pub. in The Jnl. of Physical Chemistry, v85 n21 p3187-3198 1981.

No abstract available.

AD-A109 068/7 PC **A02**/MF **A01**
University Chemical Labs., Cambridge (England). Dept. of Physical Chemistry.
Vibrational Relaxation of HCN(001) by the Noble Gases O2, N2 and CO.
Graham S. Arnold, and Ian W. M. Smith. 29 Sep 80, 12p AFOSR-TR-81-0811
Grant AFOSR-77-3240
Pub. in Jnl. of the Chemical Society, Faraday Translations 2, v77 p861-871 1981.

No abstract available.

AD-A109 069/5 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
Ground States of Molecules. 58. The C4H4 Potential Surface,
Michael J. S. Dewar, Herbert Kollmar, Francisco Carrion, and Richard C. Bingham. 14 Oct 80, 14p AFOSR-TR-81-0815
Grants AFOSR-79-0008, NSF-CHE78-03213
Pub. in Jnl. of the American Chemical Society, v103 n18 p5292-5303 1981.

No abstract available.

AD-A109 071/1 PC **A02**/MF **A01**
State Univ. of New York at Buffalo. Dept. of Chemistry.
Electrochemistry of Titanium(IV) in Basic n-Butylpyridinium Chloride-Aluminum Chloride in the Presence of Oxide,
Hogne Linga, Z. Stojek, and R. A. Osteryoung. 17 Jul 80, 9p AFOSR-TR-81-0810
Grant AFOSR-81-0007
Pub. in Jnl. of the American Chemical Society, v103 n13 p3754-3760 1981.

No abstract available.

AD-A109 072/9 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
UPE Studies of Conjugation Involving Group 5A Elements. 2. Substituted tert-Butylacetylenes,
Michael J. S. Dewar, Diane E. Cabelli, and Alan H. Cowley. 15 Oct 79, 5p AFOSR-TR-81-0816
Grant AFOSR-79-0008
Pub. in Jnl. of the American Chemical Society, v103 n12 p3290-3292 1981. See also AD-A109 123.

No abstract available.

AD-A109 074/5 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
Ground States of Molecules. Part 57. Vibration Frequencies of Boron-Containing Molecules,
Michael J. S. Dewar, and Michael L. McKee. 1 Apr 80, 15p AFOSR-TR-81-0818
Grant AFOSR-79-0008
Pub. in Jnl. of Molecular Structure, v68 p105-118 1980. See also Part 54, AD-A109 073.

No abstract available.

AD-A109 082/8 PC **A03**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Environmental Engineering.
Solute-Gas Equilibria in Multi-Organic Aqueous Systems.
Final rept.,
James M. Gossett, and Andrew H. Lincoff. 30 Nov 81, 37p AFOSR-TR-81-0858
Grant AFOSR-81-0074

The objective of this research was to study the effects of temperature, ionic strength, and presence of additional organics on the aqueous solution/gas equilibria of a variety of chlorinated organic compounds: 1,1,1-trichloroethane, tetrachloroethylene, trichloroethylene, chloroform, methylene chloride, and o-dichlorobenzene. Henry's Constant for each alone was determined in pure water over the temperature range, 10 deg - 30 deg C, using an equilibrium, batch stripping reactor. Data were fit to a regression equation. Henry's constants for selected organic solvents were determined at ionic strengths up to 1.0 M (KC1). Results suggest that ionic strength effects on activity can be ignored in systems processing ionic strengths less than 0.07 M. Henry's constants for organic solvents dissolved in multicomponent aqueous mixtures of other organic solvents were measured. It was found that relatively small concentrations of the organic solvents in water mutually affected one another's volatility. (Author)

AD-A109 086/9 PC **A03**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Chemistry.
Light Scattering from Macromolecular Systems - Molecular Crystals and Polymers.
Final technical rept.,
Elliot R. Bernstein. Nov 81, 32p AFOSR-TR-81-0861
Grant AFOSR-77-3317

The research objectives of this grant are to (1) characterize phase transitions theoretically and experimentally in molecular crystal systems, (2) use the above understanding gained by light scattering studies and theoretical interpretation to apply to the more complex system of lyotropic liquid crystals, and (3) knowledge gained on the model systems of increasing complexity is then applied to polymer liquid crystals and solid polymers as observed by laser light scattering techniques. Objective one has been definitely achieved as can be seen from the number of papers written in the last few years. Systems to have been experimentally and theoretically discussed are: trioxane, triazine, benzil, and chloranil. Others still to be investigated are: biphenyl, urea, thiourea, and hexamethyl benzene. Studies of lyotropic liquid crystals (sodium decyl sulfate, sodium sulfate, decanol, water) have been progressed to the point at which we will be reporting this data shortly. The major findings are: a number of phase transitions occur between 20 and 60 C; these transitions evidence strong critical behavior and long correlation times for fluctuations; and liquid crystals can be studied by light scattering in a unique and meaningful manner. Finally, some polymer studies were started which will be continued into the coming contract period. Spectra of solid powders, ribbons, and liquid crystals of PBT and solid PBO were obtained.

AD-A109 116/4 PC **A02**/MF **A01**
State Univ. of New York at Buffalo. Dept. of Chemistry.
Studies in Room Temperature-Chloroaluminates,
R. A. Osteryoung, G. Cheek, and H. Linga. 1981, 17p AFOSR-TR-81-0809
Grant AFOSR-81-0007
Pub. in Proceedings of the International Symposium on Molten Salts (3rd), p221-236 1981.

No abstract available.

AD-A109 122/2 PC **A02**/MF **A01**
Chicago Univ., IL. James Franck Inst.
Intermediate Case Radiationless Decay: The Excited State Dynamics of Pyrazine,
Daniel B. McDonald, Graham R. Fleming, and Stuart A. Rice. 13 Apr 81, 13p AFOSR-TR-81-0822
Grant AFOSR-81-0029
Pub. in Chemical Physics, v60 p335-345 1981.

No abstract available.

AD-A109 123/0 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
UPE Studies of Conjugation Involving Group 5A Elements. 1. Phenylphosphines,
Michael J. S. Dewar, Diane E. Cabelli, and Alan H. Cowley. 15 Oct 79, 6p AFOSR-TR-81-0819
Grants AFOSR-79-0008, NSF-CHE79-10155
Pub. in Jnl. of the American Chemical Society, v103 n12 p3286-3289 1981. See also AD-A109 072.

No abstract available.

AD-A109 137/0 PC **A02**/MF **A01**
Wisconsin Univ.-Madison.
Study of Photophysical Processes and Molecular Transformations of Excited States.
Final rept. 25 Sep 78-24 Sep 81,
Howard E. Zimmerman. 14 Dec 81, 17p ARO-15917.3-C
Grant DAAG29-78-G-0204

A brief description, including bibliography and personnel, is given of 26 years of ARO support in the area of photophysical processes and molecular transformations of excited states is given. (Author)

AD-A109 191/7 PC **A02**/MF **A01**
Martin Marietta Labs., Baltimore, MD.
Mechanism of Hydration of Calcium Silicate Based Hydraulic Binders.
Final rept. Sep 78-Sep 81,
I. Jawed, J. Skalny, and H. F. W. Taylor. Nov 81, 14p 7, ARO-15771.20-MS
Contract DAAG29-78-C-0041
Prepared in cooperation with Aberdeen Univ.

Data pertaining to the mechanism of hydration of cementitious calcium silicates (C2S, C3S), using the techniques of analytical electron and high-resolution scanning electron microscopy, trimethylsilylation, calorimetry, thermal analysis, and X-ray photoelectron microscopy, are reported. (Author)

AD-A109 359/0 Not available NTIS
Texas Tech Univ., Lubbock. Dept. of Chemistry.
Intermolecular Potential Energy Function, Second Virial Coefficients, and Oligomer Properties of Hydrogen Fluoride,
Richard L. Redington. 15 Apr 81, 7p AFOSR-TR-81-0829
Grants AFOSR-78-3616, PHS-GM-24515-02
Availability: Pub in. The Jnl. of Chemical Physics, v75 n9 p4417-4421,1 Nov 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 368/1 PC **A02**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
Configurational Effects in the Adsorption of HD on ZnO.
Technical rept.,
G. L. Griffin, and J. T. Yates, Jr. Dec 81, 12p Rept no. TR-24
Contract N00014-81-F-0008

Hydrogen deuterate, (HD) adsorption on ZnO surfaces has been studied by infrared spectroscopy as a function of ZnO temperature. It is shown that at 300K, the configuration Zn(H)-O(D) is preferred, as expected on thermodynamic grounds. As the temperature is lowered, the configuration Zn(D)-0(H) becomes preferred on kinetic grounds. We demonstrate that configuration reversal on heating must proceed via HD desorption and subsequent re-adsorption. This behavior is consistent with a model in which the transition state for HD adsorption is characterized by nearly complete dissociation of the H-D bond.

AD-A109 382/2 PC **A03**/MF **A01**
Virginia Univ., Charlottesville. Dept. of Chemistry.
Boranametallacarboranes. 2. Crystal and Molecular Structures of (2, 3-(C2H5)2C2B4H4)-5-Co(B9H12-1-O(CH2)4), (2,3-(CH3)2C2B3H5)-5-Co(B9H12-1-O(CH2)4), and (1,2-(C2H5)2C2B7H7)-6-Co(B9H12-2-O(CH2)4).
Technical rept.,
Lester Borodinsky, Ekk Sinn, and Russell N. Grimes. Dec 81, 43p Rept no. TR-40
Contract N00014-75-C-0305

No abstract available.

AD-A109 410/1 Not available NTIS
Battelle Memorial Inst., Columbus, OH.
Many-Body Perturbation Theory and Coupled Cluster Theory for Electron Correlation in Molecules,
Rodney J. Bartlett. 1981, 44p ARO-16929.1-P
Contracts DAAG29-80-C-0105, N00014-79-C-0821
Availability: Pub. in Annual Review of Physical Chemistry, v32 p359-401 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

ANU-P-771 PC **A02**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Electron Vacancy Production in Near-Symmetric Collisions of 100 Mev Copper Ions.
H. J. Hay, L. F. Pender, and P. B. Treacy. Mar 81, 14p
U.S. Sales Only.

Using a high-resolution Si(Li) X-ray detector, characteristic K X-rays have been detected with targets of Cr, Fe, Cu, Ge and Se bombarded by 100 MeV Cu ions, equilibrated by passing through carbon. Cross sections for X-ray production, target-to-projectile vacancy-sharing ratios and Ksub(alpha) to Ksub(beta) ratios, were measured and compared to predictions of molecular-coupling theories. The results show little agreement with existing models based on rotational coupling in molecular-orbital states. (Atomindex citation 12:614517)

CEA-CONF-5209 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Grenoble (France). Service d'Ionique Generale.
Charge Transfer Cross-Sections of Argon Ions Colliding on Argon Atoms.
J. Aubert, S. Bliman, N. Chan-Tung, R. Geller, and B. Jacquot. Apr 80, 13p
Meeting on low energy ion beams, Bath, UK, 14 - 17 Apr 1980.
U.S. Sales Only.

A device has been built to measure charge changing cross-sections of argon ions colliding on argon atoms. It consists of an E.C.R. ion source (Micromafios) that delivers argon ions up to charge + 13. The ion source potential may be varied from 1 up to 10 kVolts. A first magnet is used to charge analyze the extracted beam. For a given separated charge state, the ion beam is passed in a collision cell whose pressure may be varied. The ions undergoing collisions on the target are analyzed by a second magnet and collected. The pressure is varied in the collision cell in order to check that the single collision condition is satisfied. It is shown that the ions do two types of collisions: charge exchange and stripping whose cross-sections are measured. Interpretation of charge exchange is proposed along yet classic theoretical approaches. As to stripping no available theory allows interpretation. (Atomindex citation 11:566569)

CEA-CONF-5315 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Atomique.
Multiphoton Transitions in Continua.
F. Fabre, P. Agostini, and G. Petite. Aug 80, 6p CONF-8008120-2(Sum.)
International conference on atomic physics, Cambridge, MA, USA, 4 Aug 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5497 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Atomique.
First Experimental Evidence of an Antiresonance in the Two-Photon Ionization of Cs Atoms.
J. Morellec, and D. Normand. Jun 80, 4p CONF-800614-5
11. international quantum electronics conference, Boston, MA, USA, 23 Jun 1980.
U.S. Sales Only.

We have measured the two-photon ionization cross-section of cesium atoms in the laser wavelength range of 460-540 nm. The agreement with theoretical calculations which predicted a deep minimum in sigma sub 2 values is satisfactory. (Atomindex citation 12:614545)

DESY-SR-79/30 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Observation of Resonance Recombination Lines in Electron Excited Auger Spectra of Gd.
F. Gerken, J. Barth, K. L. I. Kobayashi, and C. Kunz. Nov 79, 13p
U.S. Sales Only.

Combined measurements of electron excited Nsub(4,5) Auger spectra and photoelectron emission on clean and oxidized Gd lead to a distinction between Auger lines originating from 4d implies continuum and 4d implies 4f resonance excitations. Several Auger structures are identified as due to the direct recombination of 4d exp 9 4f exp 8 states with the 4f and valence electrons. The shape of the most prominent Auger line for oxidized Gd agrees perfectly with the Fano profile of the 4f photoemission intensity. (Atomindex citation 11:560481)

DE81031961 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Air Desorption from a Water Film.
D. Edwards, Jr. 1981, 7p BNL-30100, CONF-811113-15
Contract AC02-76CH00016
American Vacuum Society national symposium, Anaheim, CA, USA, 3 Nov 1981.

The thermal desorption of air cryotrapped in a water film is reported. In addition, the non-effect of pure water overlayers is observed. The practical implication is that this type of system could be able to be used as a pump of air in a vacuum system. (ERA citation 06:035348)

DE82001626 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Equilibrium-Pressure Isotherms for the System Lithium-Lithium Hydride-Hydrogen at 823, 873, and 923 exp 0 K.
R. F. Simandl. Oct 81, 24p Y-2242
Contract W-7405-ENG-26

Full equilibrium-pressure isotherms for the system lithium-lithium hydride-hydrogen at 823, 873, and 923 exp 0 K were determined. Expressions for the solubility of hydroen in liquid lithium at these three temperatures were derived. The stoichiometry of the lithium hydride present as hydrogen-to-lithium atom ratios approached unity was determined. (ERA citation 07:003489)

FIAS-R-57 PC **A03**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. School of Physical Sciences.
Continuum in the Atomic Optical Model.
I. E. McCarthy, and A. T. Stelbovics. Dec 79, 37p
U.S. Sales Only.

The optical potential in principle gives a complete description of the effect of the target continuum on an electron scattering problem truncated to a discrete set of channels. A momentum-space form for the optical potential has been derived and computed for the continuum in various approximations for the case of hydrogen. The total ionization cross section is excellently reproduced in the weak-coupling approximation above 100eV by the most detailed model, and is tolerable as low as 50eV. (Atomindex citation 11:560483)

FIAS-R-59 PC **A03**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. School of Physical Sciences.
Electron Coincidence Spectroscopy of O-2: Valence Electron Distributions and Binding Energies.
I. H. Suzuki, E. Weigold, and C. E. Brion. Dec 79, 28p
U.S. Sales Only.

The binding energy spectra and momentum distributions for the valence orbital transitions of molecular oxygen have been obtained using the (e,2e) reaction at total energies of 400 and 1200eV. The outer pi sub(g) orbital is found to have a wave function which is significantly more extended in momentum space than that of the more tightly bound pi sub(u) orbitals. This is interpreted as arising from the single occupancy of the anti-bonding pi sub(g) orbitals. Peaks at 39eV and 47eV are assigned to sup(4,2) sigma sub(g) exp - in states on the basis of the observed momentum distributions. The momentum distribution and observed intensity for the 32.5eV transition supports the assignment of exp 2 Pisub(u) for this ion state. The measured relative strengths for the various Pisub(u) and sigma sub(u) transitions are in qualitative agreement with CI and Green's function calculations. (Atomindex citation 11:560484)

FIAS-R-60 PC **A03**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. School of Physical Sciences.
Momentum Distributions and Ionization Potentials for the Valence Orbitals of Hydrogen Fluoride and Hydrogen Chloride.
C. E. Brion, S. T. Hood, I. H. Suzuki, and E. Weigold. Feb 80, 42p
U.S. Sales Only.

The binding energy spectra and momentum distributions for the valence orbitals of HF and HCl have been obtained using (e,2e) spectroscopy with symmetric kinematics at 1200eV and 400eV. For HCl the strength of the innermost valence orbital (4sigma) is found to be significantly split among several ion states in the range 25eV to 41eV. The corresponding orbital in HF (2sigma) is however not significantly split among ion states. The measured momentum distributions are compared with the results of several calculatons of at least double zeta quality as well as with a one particle Green's function calculation of the generalized overlap amplitude. Agreement in shape is quite good for the innermost orbitals, but for the pi and outer sigma orbitals of HF the momentum distributions calculated directly from the molecular orbitals are significantly more extended in momentum space than the measured distributions. The Green's function calculations give momentum distributions in good agreement. (Atomindex citation 11:560485)

IAEA-R-1887-F PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Electron-Nuclear Double Resonance in Solids: 1. Nuclear Moments. 2. Uniaxial Stress Effects. Final Report for the Period 1 December 1976 - 28 February 1979.
C. Fainstein. Jul 80, 14p
U.S. Sales Only.

Ligand ENDOR spectroscopy has been performed in fluorite-type single crystals under uniaxial stress along the bonding axis with either Yb exp 3+ or Tm exp 2+ paramagnetic impurities. Following Baker and Fainstein (1975) the frequency shift of the ENDOR spectral lines is related to the change in ion-ligand interaction with stress, the results thus obtained are compared with current models for an impurity ion in a lattice. (Atomindex citation 11:566701)

IAEA-R-2043-F PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Theoretical Study of Charge Exchange, Ionization and Electron Loss Processes, Relevant to Controlled Thermonuclear Research. Final Report for the Period 1 February 1977 -34A 28 February 1980.
R. Janev. Mar 81, 18p
U.S. Sales Only.

The following processes have been studied: a) Single and double charge exchange in low, medium and high energy collisions of atoms with multiply charged ions; b) Excitation and ionization processes in low, medium and high energy collisions between multiply charged ions and atoms; c) Ion-ion recombination and ion-pair formation collision processes between hydrogen and alkali atoms (ions); d) Resonant and Auger processes in slow collisions of atomic particles with solid surfaces (including surfaces covered by a sub-monoatomic layer). Processes a) and b) are important for the "impurity problem" of magnetically confined tokamak plasmas, whereas processes c) and d) for the production and transport of intense neutral beams for plasma heating. (Atomindex citation 12:614550)

IEA-DT-156 PC **A05**/MF **A01**
Instituto de Energia Atomica, Sao Paulo (Brazil).
Study of the Atomic Motion in Methanol by Slow Neutron Scattering.
C. Rodrigues. Feb 79, 81p
In Portuguese.Thesis (Ph.D.).
U.S. Sales Only.

Cold neutron scattering data are reported for methyl alcohol in the liquid phase at room temperature. The quasielastic scattering was interpreted using the Larsson and Bergstedt model, that takes into account intramolecular motions and molecular diffusion. On the basis of this model, one finds for the relaxation time of the hindered rotation of the CH sub 3 group within the molecule a value 2,4 x 10 exp -12 sec. The analysis of the quasielastic scattering to the L-B model explain in a consistent way our experimental results in a range of momentum transfers of about 0.80 - 1.55A exp -1 . In the inelastic region some structure is observed at energy transfers of 22, 17 and 5 meV. The 17 meV energy transfer is associated with the 1 implies 0 transition of the torsional oscillations of the methyl group. The activation energy for the above motion was calculated to be E=1.3 kcal/mol, in good agreement with the value of the barrier height for internal rotation of the CH sub 3 in methanol. (Atomindex citation 11:563049)

INR-1868/C/B PC **A03**/MF **A01**
Institute of Nuclear Research, Warsaw (Poland).
ESR Spectra of Organic Molecules in Triplet State; Studies on the Structure, Internal Interaction and the Influence of Environment.
T. Kemp, and H. B. Ambroz. 1980, 29p
In Polish.
U.S. Sales Only.

The origins, features and interpretation of triplet state e.s.r. spectra are described. Examples chosen for discussion include carbenes, nitrenes and excited polyacenes. Newly discovered triplet-state substituted aryl cations are described, the D - parameters of which give information as to mechanism of pi -stabilization of these unusual species. (Atomindex citation 12:614551)

IPPJ-411 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Single-Electron Capture into Ar exp + Excited States in Ar exp 2+ + Na Collision Below 12 KeV, 2. Relative Population Distribution in Ar exp + Excited States.
A. Matsumoto, S. Tsurubuchi, K. Okuno, S. Ohtani, and T. Iwai. Aug 79, 27p
U.S. Sales Only.

Excitation cross-sections are obtained for each term of the ArII nl-states (nl = 4p, 4p' and 4d) at 4 and 8 keV. The relative population distribution among the terms of a given nl-state can be interpreted in terms of statistics based on the building-up principle of molecule under radial coupling scheme. The relative population distribution among the multiplets in a given term is proportional to their statistical weight; spin-orbit recoupling at large internuclear separations is responsible for the population mechanism. The energy dependence of excitation cross-sections is discussed in connection with the Landau-Zener theory. (Atomindex citation 11:560488)

IPPJ-422 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Post Collision Interaction in Photoexcited Argon LMM Auger Processes.
H. Hanashiro, Y. Suzuki, T. Sasaki, A. Mikuni, and T. Takayanagi. Sep 79, 11p
U.S. Sales Only.

The L sub(2,3)M sub 23 M sub 23 Auger-electron spectra of Argon produced by photoionization have been studied. The range of photon energy is from 249 eV, just above the L sub 3 edge, to 270 eV. Closer the photon energy is to the threshold, the effect of the post-collision interaction is more conspicuously observed as a shift of the peak and assymmetric profile in each Auger line. The observed dependence of energy shift upon the kinetic energy of photoelectron has been compared with the semi-classical theory after Niehaus and the mean lifetime for Auger decay of inner-shell hole is deduced to be 2.4 x 10 exp -14 sec. (Atomindex citation 11:560489)

JINR-R-17-80-47 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Stochastic Processes on Channeling.
G. M. Gavrilenko, and V. K. Fedyanin. 1980, 16p
In Russian.
U.S. Sales Only.

The Markov approximation of the equation for the distribution function of the channeling particle beam is constructed. It is used for the investigation of the transversal energy distribution. The two limits are considered: a)z<infinity, E sub 0 implies infinity, b) z implies infinity, E sub 0 < infinity. It is shown that the first of it corresponds to the Lindhard's equation. (Atomindex citation 11:566721)

JINR-R-4-13047 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Quasipotential Equation for Muonic Atoms of Hydrogen Isotopes.
D. D. Bakalov. 1980, 12p
In Russian.
U.S. Sales Only.

The Todorov like quasipotential is drawn explicitly for electromagnetic interaction of two particles with spin 1/2 or 1 and possessing an electromagnetic structure. Approximate equations (with the accuracy up to approximately a exp 2 terms including) for particle pairs with spin (1/2, 1/2), (1,1/2) and (1,1,) are obtained in the coordinate presentation. There have been calculated electromagnetic form factors of protons, deuterons and tritons as well the first nonvanishing relativistic corrections to the ground state hfs of the p mu exp - , d mu exp - and t mu exp - muonic atoms. It is stated that the quasipotential thus constructed can be applied to many-body problems as a correction to the Coulomb pairing potential as well. (Atomindex citation 11:563069)

N82-14283/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Aerosil for the Improvement of the Flow Behavior of Powdered Substances.
Dec 81, 28p NASA-TM-76643
Contract NASW-3542
Transl. into English from Schriftenreihe Pigmente, Degussa, (Frankfurt), No. 31, 10 Aug. 1971 p 1-17. Transl. By Scitran, Santa Barbara, Calif.

The tendency of powdered substances to agglomerate and stick together is studied. The highly dispersed silicic acid Aerosil (tradename) is studied as an agent to improve the free flowing characteristics of powdered materials. It was concluded that the use of Aerosil 200, Aerosil R 972, aluminum oxide C and sylicic acid D 17 as flow agents caused broad improvements in the flow properties of powders. Additionally, the sifting, dispersion, and spray behavior, as well as the grinding and air separation characteristics of powders were improved.

N82-14309/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Determination of a Kinetic Region in Catalytic Oxidation of Carbon Monoxide.
M. Y. Sultanov, and K. A. Sadykhova. Nov 81, 7p
NASA-TM-76651
Contract NASW-3542
Transl. into English from Azerb. Khim. Zh. (USSR), No. 2, 1980 p 3-6. Transl. By Scitran, Santa Barbara, Calif.

The catalytic activity of cupric oxide activated with ceric oxide in a broad interval of volumetric velocities was investigated. It was determined that for practical catalysts used in the diffuse region, dilution of the active substance by an inert diluent increases the effectiveness of the catalysts.

N82-14326/4 PC **A05**/MF **A01**
Max-Planck-Inst. fuer Stroemungsforschung, Goettingen (Germany, F.R.).
Investigation of Luminescence in the Charge Exchange Process of AR++ with N2 of n(+) With CO Untersuchung der Lumineszenz Beim Ladungsaustausch von AR++ MIT N2 und n+ MIT CO.
D. Neuschaefer. Mar 80, 80p MPIS-3/1980, ISSN-0436-1199
Text in German.

Luminescence spectra of two ion-molecular reactions were analyzed using computerized simulation. Vibration and rotation states of the luminescent reaction products were studied in terms of impact dynamics. The charge exchange of Ar++ ions with molecular nitrogen and the reaction of N+ ions with CO (in an energy domain from 3 to 1000 eV) were investigated in their electronically excited states. The rotational spectra depend on the vibration level and show increased rotation excitation at lower energy.

N82-14443/7 PC **A03**/MF **A01**
Helsinki Univ. of Technology, Otaniemi (Finland).
Preparation, Thermal Properties, Solid Solution Formation and Some Luminescence Properties of Rare Earth Oxysulfides.
Ph.D. Thesis.
M. Leskela. 1980, 39p ISBN-951-751-949-4, RP-64

The preparation of rate earth oxysulfides, including their solid solutions, was studied, with particular attention to a method involving reduction of corresponding sulfites in carbon monoxide atmosphere. The thermal stability of the different phase and their oxidation products is noted. A method based on the luminescence lifetime of Eu(3+)luminescence for the determined of the activator concentration in europium activated yttrium oxysulfide is introduced. The effect of host cation solid solution on the intensity and life-time of europium luminescence is discussed. The effects of the host lattice, impurities, activator concentration, and particle size on the luminescene spectra and reviewed for europium activated yttrium oxysulfide, Eu(3+)iY2O2s.

N82-14935/2 PC **A10**/MF **A01**
Paris-11 Univ., Orsay (France). Lab. de Physique des Plasmas.
Study of Metastable States of Atomic Nitrogen in Luminescent Discharges Etude des Etats Metastables de l'Azote Atomique dans des Decharges Luminescentes.
G. Cernogora. Jan 81, 202p LP-185
Text in French.

For the first and second metastable states of nitrogen atoms, the diffusion coefficient and the coefficient of occurrence of these states due to electronic collisions were determined. The kinetic behavior of these metastable atoms was established by optical absorption measurement in the far UV. Results show that the coefficients of electronic excitations can be deduced from measurements of the concentration of these states in a luminescent discharge. The diffusion coefficient is found by analyzing the evolution of their concentration in a post-discharge. The saturation limit at which concentration of metastable states no longer increases with electron density is also identified.

PB82-143405 PC **A02**/MF **A01**
Rockwell International, Newbury Park, CA. Environmental Monitoring and Services Center.
Trace Analysis for Aromatic Hydrocarbons in Natural Waters.
Journal article,
Ihor Lysyj, George Perkins, and John S. Farlow. 15 Jan 81, 12p EPA-600/J-80-365
Contract EPA-68-03-2648
Pub. in Environmental International, v4 p407-416 1980.

A method of trace analysis of volatile aromatic hydrocarbons in natural water is described. The method is based on sparging water samples with nitrogen, adsorption of hydrocarbons on activated charcoal, followed by desorption into carbon disulfide and gas chromatographic analysis. The sensitivity of the method reaches into the 0.1 to 0.2 micrograms/L concentration range for individual aromatic hydrocarbons. The accuracy and reliability of the method was validated. The method was used in three field studies: dispersion of aromatic hydrocarbons discharged from the Trans-Alaska Pipeline southern terminal throughout Port Valdez; survey of the Atigun River Watershed after the oil spill on June 10, 1979; and chemical characterization of treated effluents from offshore oil extraction platforms in the Gulf of Mexico.

PB82-143439 PC **A02**/MF **A01**
Environmental Monitoring Systems Lab., Las Vegas, NV.
A Computer Control and Acquisition System for Atomic Absorption Data.
Journal article,
Lawrence E. Holboke. 1981, 24p EPA-600/J-80-111
Pub. in Chemical, Biomedical, and Environmental Instrumentation, v11(1) p27-48 1981.

A system is presented that controls and acquires data from a Perkin-Elmer 603 or similar atomic absorption spectrophotometer operating in the flame mode and equipped with a 200 place auto-sampler. The hardware consists of a PDP11 computer with minimum peripheral equipment and a simple instrument interface. The software is primarily a single large Fortran proram in an RT-11, V3B operating system environment. The use of overlays reduces memory requirements to about 24 kilowords. The software provides for permanent storage of verified analytical data on a primary device and a secondary, backup device, in addition to printed reports. Data handling techniques allow correction for baseline and sensitivity drift, detection limit estimation, calculation of spike recoveries, and the use of standard additions analysis methods. Emphasis has been placed on quality control procedures, easily understood operator dialogue, and data security.

PB82-149071 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron Impact Ionization Cross Sections and Rates for Highly Ionized Berylliumlike Ions,
S. M. Younger. Sep 81, 8p
Pub. in Physical Review A 24, n3 p1278-1285 Sep 81.

Electron impact ionization cross sections and rates have been calculated for several berylliumlike ions in

the 1 doublet S 2 doublet S 1S ground state and the 1 doublet S 2s 2p 3p metastable state using a distorted wave Born-exchange approximation. The ground state cross section showed only minor deviations from classical scaling along the isoelectronic sequence. The 2s2p (3)p cross section was more than twice that of the ground state at carbon III, decreasing to a factor of 1.35 greater at Ar XV. Dominant ground state configuration interaction of the form 2 doublet s + 2 doublet p changed the total cross section by only a few percent. An analytic fit to the distorted wave data is given which allows calculation of non-relativistic electron impact ionization cross sections and rates for beryllium like ions. A comparison to available experimental data shows good agreement between measurements and distorted wave calculations.

PB82-149097 Not available NTIS
National Bureau of Standards, Washington, DC.
Optical Heterodyne Saturation Spectroscopy.
Final rept.,
J. L. Hall, L. Hollberg, T. Baer, and H. G. Robinson.
Nov 81, 3p
Contract N00014-77-C-0656, Grant NSF-PHY79-04928
Pub. in Applied Physics Letters 39, n9 p680-682, 1 Nov 81.

The authors discuss a refined, hybrid rf/optical technique for studying sub-Doppler saturated absorption/dispersion resonances with excellent precision and symmetry. Sensitivity is limited mainly by fundamental noise in the signal. Resonance profiles obtained in I2 are in remarkable agreement with theory. The method promises a new level of accuracy for laser locking to an optical resonance. Nonequilibrium response is also discussed.

PB82-149113 Not available NTIS
National Bureau of Standards, Washington, DC.
Accurate Wave-Number Measurements of Uranium Spectral Lines,
B. A. Palmer, R. A. Keller, F. V. Kowalski, and J. L. Hall. Aug 81, 5p
Contract N00014-77-C-0656, Grant NSF-PHY79-04928
Pub. in Jnl. Opt. Soc. Am. 71, n8 p948-952 Aug 81.

Wave number measurements made on 10 uranium and 2 thorium transitions using the optogalvanic effect in a hollow cathode discharge to a position in a single-frequency, cw dye laser to the peak of a transition. The wavenumber of the dye laser was measured by comparing it to the wave number of an iodine-stabilized He-Ne laser. The accuracy of the wave number measurements was + or - 0.002/cm with previously reported uranium and thorium measurements whose estimated accuracy was + or - 0.003/cm.

PB82-149139 Not available NTIS
National Bureau of Standards, Washington, DC.
Cross Sections and Rates for Direct Electron Impact Ionization of Sodiumlike Ions,
S. M. Younger. Sep 81, 6p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Physical Review A 24, n3 p1271-1277 Sep 81.

Cross sections and rate coefficients for the direct electron impact ionization of sodiumlike ions have been calculated in a distorted wave Born-exchange approximation. For higher charge states the cross section is dominated by inner shell ionization of the 2p sup 6 subshell. Analytic fits to the data allow rapid calculation of cross sections and rate coefficients over a wide range of incident electron energies. The importance of electron impact excitation to autoionizing states is discussed.

PB82-149147 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron Impact Ionization Cross Sections and Rates for Highly Ionized Atoms,
S. M. Younger. 1981, 9p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer 26, n4 p329-337 1981.

Electron impact ionization cross sections and rates for hydrogen-, helium- and lithium-like ions are presented in simple analytical form, based on a set of parameters derived from distorted wave exchange cross section calculations. Isoelectronic fits to the parameters used in the formulae allow rapid generation of cross sections and rates for any ion in these sequences with a minimum of computational effort. The use of accurate Bethe slopes in the cross section-fitting algorithm yields good accuracy both in the near threshold and high energy regions. The rate coefficient is given in the form of a correction to the commonly used Seaton formula and is thus readily adaptable to existing plasma modeling computer codes. Comparisons of the present results with other theoretical and experimental data are made.

PB82-149154 Not available NTIS
National Bureau of Standards, Washington, DC.
Computer Simulation of Titration Curves with Application to Aqueous Carbonate Solutions,
A. K. Covington, R. N. Goldberg, and M. Sarbar. 1981, 7p
Pub. in Analytica Chimica Acta 130, p103-109 1981.

A computer simulation calculation is used to generate theoretical acid-base titration curves for aqueous carbonate solutions. The calculation allows for the time delay in the conversion of aqueous CO2 to H2CO3 and permits the calculation of concentrations of the species in solution and their time derivatives during the course of a titration. Detailed calculations, which include the effect of the time delay, show that the existence of a peak in the differential titration curve corresponds to the protonation of a species in solution, and that no extra peaks are produced as a result of the time delay. The calculations also show the pH values obtained from such titrations are not affected by the time delay, and that a systematic error may be incurred when such titrations are used for analytical purposes when the rate of addition of titrant is too rapid.

PB82-149162 Not available NTIS
National Bureau of Standards, Washington, DC.
Energy Calculations of the Crystal Structure of the Low Temperature Phase (II) of Polytetrafluoroethylene.
Final rept.,
Barry L. Farmer, and Ronald K. Eby. Nov 81, 9p
Pub. in Polymer 22, p1487-1495 Nov 81.

Energy analysis is used to determine the low energy crystal structure for polytetrafluoroethylene molecules in the 13/6 and 54/25 conformations. The structure for the 54/25 conformation contains an ordered repeating pattern of a left- and right-handed pair of molecules in a unit cell having projected parameters, a', b', and gamma' of 9.60 A, 5.62 A, and 91.4 degrees, respectively. These results, the relative orientations of the molecules, and the relative translations of the molecules are in good agreement with results obtained in a concurrent and independent analysis of diffraction data. Energies calculated for rotational and translational displacements in various modes suggest that a range of structures and a fairly large amount of disorder may be present, also in agreement with experiment.

PB82-149188 Not available NTIS
National Bureau of Standards, Washington, DC.
Thermodynamic Anomalies at Critical Points of Fluids.
Final rept.,
S. C. Greer, and M. R. Moldover. 1981, 33p
Pub. in Annual Review of Physical Chemistry 32, p233-265 1981.

Recent measurements of the thermodynamic properties of fluids near critical points are reviewed in the context of current theory. Measurements near liquid-vapor and liquid-liquid critical points (consolute points) are considered. The thermodynamic properties reviewed include: the density and composition of coexisting phases in equilibrium, thermal expansion, heat capacity, equation-of-state, and finally the dependence of the density of pure fluids upon height extremely near the critical temperature. Some remarks are made concerning future directions for research. A list of 203 references to relevant literature is included.

PB82-149204 Not available NTIS
National Bureau of Standards, Washington, DC.
Concentration Dependence of Diffusion Coefficient at Various Molecular Weights and Temperatures.
Final rept.,
Charles C. Han, and A. Ziya Akcasu. Sep 81, 4p
Pub. in Polymer 22, p1165-1168 Sep 81.

The effect of temperature on the concentration dependence of the diffusion coefficient D(c) is investigated experimentally by light scattering using polystyrene with Mw = 179,000 and 900,000 in toluene and cyclohexane at several temperatures. It is found that D(c) decreases with concentration under theta condition, and increases in good solvents. The continuous transition from theta to good solvent behavior is explored, and the results are compared to the existing theoretical predictions.

PB82-149790 Not available NTIS
National Bureau of Standards, Washington, DC.
Dynamic Light Scattering of Dilute Polymer Solutions in the Nonasymptotic q Region.
Final rept.,
C. C. Han, and A. Z. Akcasu. 1981, 5p
Pub. in Macromolecules 14, p1080-1084 Jul-Aug 81.

Polystyrene solutions in the dilute region have been studied by dynamic light scattering experiments.

PB82-149816 Not available NTIS
National Bureau of Standards, Washington, DC.
Comment on Chemical Potentials in Solids.
Final rept.,
William C. Johnson, and John W. Cahn. 1981, 6p
Pub. in Scripta Metallurgica 15, p1259-1264 1981.

In a pair of recent Scripta Metallurgica articles (1,2), Nolfi claims that chemical potentials can be defined for both solid (substitutional) and fluid (interstitial) components in nonhydrostatically stressed materials. This is accomplished assuming that at equilibrium the combined form of the first and second laws of thermodynamics for a closed stressed system can be extended directly to an open system. Unfortunately, the resulting equation is improper for it does not represent correctly the work done by the system. It is the intent of this note to clarify the basic postulates employed by Nolfi in defining equations for chemical potentials in stressed solids and to illustrate that extension from a closed to an open system is not necessarily straightforward.

PB82-149857 Not available NTIS
National Bureau of Standards, Washington, DC.
Interaction of Zinc Ions with Hydroxylapatite,
D. N. Misra, and R. L. Bowen. Oct 81, 14p
Contract PHS-DE-05129-03
Pub. in Absorption from Aqueous Solutions, p179-192 Oct 81.

The interaction between zinc ions in aqueous nitrate solutions and hydroxylapatite, the structural prototype for the principal inorganic constitutent of tooth and bone was studied. The nature of this interaction may be important in elucidating the role of zinc oxide commonly dissolved in the phosphoric acid solutions used to etch hard tooth tissues prior to the application of dental resins. This study also has a direct bearing on the suitability of zinc ions as candidate 'mordants' for use with surface-active comonomers that promote adhesion between restorative resins and hard tooth tissues.

PB82-149873 Not available NTIS
National Bureau of Standards, Washington, DC.
Tensile Failure of Crystalline Polymers,
Anton Peterlin. 1981, 19p
Pub. in Jnl. Macromol. Sci.-Phys. B19, n3 p401-419 1981.

In the creep experiment the brittle fracture of the unoriented semicrystalline polymers at very small and very high tensile load with the intermediate ductile region may be explained by the competition between the crazing and the shear band formation during the microcrack growth phase. The former type of microcrack growth leads to brittle fracture while the latter type yields the necking which transforms the original lamellar into the final fibrous structure. The actual fate of the strained sample depends on the growth time of the craze, t(g), and of the shear band formation time, ts. If T(g) less than t(s) the material will break in a brittle manner and if t(g) greater than t(s) the material will deform plastically. The failure of the fibrous material seems to occur when the ratio between the average distance and diameter of the microcracks reaches a value about 3. The microcracks seem to form primarily at the defects of the microfibrillar structure, i.e., at the ends of microfibrils where the axial connection of subsequent crystal blocks through the amorphous layers by a great many taut tie molecules is either completely interrupted or at least drastically reduced. The stress concentration resulting from the opening of these defects into microcracks ruptures some of the adjacent

microfibrils. Such nucleation and the subsequent lateral growth of the microcrack ruptures the taut tie molecules in its path. The ruptured molecules yield free radicals which can be monitored by the electron spin resonance.

PB82-152034 Not available NTIS
National Bureau of Standards, Washington, DC.
Vibrational State Dependence of Partial Cross Sections and Photoelectron Angular Distributions through Autoionizing Resonances: The n=3 Rydberg State Converging to the B(2) sigma(+1) State of CO(+1).
1981, 14p
Grants NATO-1735, NATO-1939
Sponsored in part by Office of Naval Research, Arlington, VA., Department of Energy, Washington, DC.
Pub. in Proceedings of the Royal Society (London) A378, p423-435 1981.

The branching ratios for leaving the CO(+1) ion in a particular vibrational level of the ground X(2) sigma(+) state have been determined as functions of photon energy through the n=3 autoionizing Rydberg state converging to the B(2) sigma(+) state of CO(+) there are substantial differences between theoretical and experimental Franck-Condon factors when 'on' resonance. The branching ratios have been converted into absolute partial cross sections by normalizing to existing data obtained by using line sources. The asymmetry parameter beta has also been determined for each vibrational level in this spectral range. Considerable variations in both have been observed in the region of this resonance.

PB82-152042 Not available NTIS
National Bureau of Standards, Washington, DC.
BA II Fluorescence from Barium Atoms Resonantly Photoionized by 584A Radiation,
B. E. Cole, E. B. Saloman, and D. L. Ederer. Dec 81, 5p
Grant NATO-1735
Pub. in Jnl. of the Optical Society of America 71, n12 p1458-1462 Dec 81.

The first reported study of fluorescence spectrum of a metal vapor resonantly excited by vacuum-ultraviolet radiation has been made in Ba II. Seven Ba II fluorescent transitions have been identified for Ba vapor excited by 584A radiation. The intensities of these transitions are consistent with the population distribution of excited Ba II observed by using photoelectron spectroscopy. No detectable Ba II fluorescence was observed when 736-742 A excitation was used.

PB82-152059 Not available NTIS
National Bureau of Standards, Washington, DC.
Laser Magnetic Resonance Measurement of Rotational Transitions in the Metastable a(1) delta(g) State of Oxygen,
A. Scalabrin, R. J. Saykally, K. M. Evenson, and H. E. Radford. 1981, 8p
Pub. in Jnl. Mol. Spectros. 89, p344-351 1981.

Laser magnetic resonance (LMR) for five rotational transitions, of the oxygen molecule (16)O(16)O in its metastable state, a(1)delta(g), nu=0, are observed using six fir laser lines.

PB82-152067 Not available NTIS
National Bureau of Standards, Washington, DC.
Optical Bistability by an Atomic Vapor in a Focusing Fabry-Perot Cavity,
W. J. Sandle, and A. Gallagher. Oct 81, 12p
Pub. in Physical Review A 24, n4 p2017-2028 Oct 81.

The authors report exprimental observations of dispersive- and absorptive-optical bistability due to saturation of the D(1) line of atomic sodium in a tigh-focused Fabry-Perot cavity. Under the conditions of large optical power broadenig and substantial collisional broadening by argon buffer gas used for part of the data, the sodium very nearly behaves as a two-level homogeneously broadened absorber. It thus yields a test of the two-level mean-field optical-bistability model. That model, including homogeneous broadening, fails to account quantitatively for the power levels and power dependencies of the cavity transmission. In particular, this model predicts too rapid an onset of atomic saturation with cavity power. In contrast, predictions of a two-level Gaussian-field optical-bistability model for the dependence of transmitted power as a function of laser power and frequency are confirmed by the experimental data. However, there is a remaining discrepancy in the absolute value of the cavity power.

PB82-152216 PC **A06**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
The Development and Evaluation of an Electronic Emission Spectral Index Which Can Be Related to the Carcinogenic Hazard of the Respirable Portion of Coal-tar Pitch Volatiles.
Final rept. 1 Jun 71-31 May 72.
May 72, 157p

The possibility of relating an electronic emission spectral index to the carcinogenicity of respirable portions of coal-tar pitch volatiles is investigated. Photophysical properties are determined for 34 polynuclear aromatic hydrocarbons and their heterocyclic analogs. Statistical analysis of the results indicates that there is no significant correlation, with the exception of fluorescence lifetimes, between these properties and the known carcinogenic activity of the compounds studied. An electronic emission spectral index for carcinogenic hazards based on these photophysical properties does not exist for the compounds studied. An index based on fluorescence lifetimes could potentially be used to evaluate the carcinogenic hazard of an untested pure compound, but such an index would not be applicable to mixtures. Testing the photodynamic activities of the compounds using the crustacean Artemia salina shows good statistical correlation between photodynamic activity and carcinogenicity. This method, although untested on mixtures, should be applicable to air samples and other polynuclear aromatic mixtures.

PB82-152331 PC **A04**/MF **A01**
Spex Industries, Inc., Metuchen, NJ.
A Microwave Induced Emission Spectrometric System for Subnanogram Multielemental Analyses of Biological Materials and Atmospheric Samples.
Final rept.,
J. F. Moore, and D. O. Landon. 31 Oct 73, 67p
Contract PHS-HSM-99-72-122

The feasibility of microwave-induced emission spectrometry as an in-house analytical tool for the simultaneous analyses of trace elements in biological and environmental samples of occupational health interest is investigated. It is found that direct microwave excitation of as-is samples yields meaningful data only for mercury and possible cadmium; for less volatile elements the microwave technique can give results at ultra-trace levels, but only on specially prepared samples. With new programming, the Chemscan is successful in looking simultaneously at the wavelengths corresponding to 16 different elements. Data on NIOSH samples of blood, urine, lung, and particulates on a filter is provided, based on these measurements and those done via mass spectroscopy.

PB82-152372 Not available NTIS
National Bureau of Standards, Washington, DC.
Atomic Spectroscopy,
W. L. Wiese, and G. A. Martin. 1981, 10p
Pub. in Physics Vade Mecum AIP 50th Anniversary (Chapter 5), p96-105 1981.

A compendium of definitions of atomic spectroscopic quantities, along with formulae and tables of data which are frequently used by atomic spectroscopists and by scientists who are interested in applications of atomic spectroscopic data to other fields of physics, is presented. Topics covered include the following: Description of spectra, spectroscopic notation and electron coupling schemes; Photon energies and spectral line positions; Wavelength standards; Selection rules for discrete transitions; Atomic wave functions; Spectral line intensities, transition probabilities, f-values, and line strengths; Atomic lifetimes; Hydrogenic (l-electron) spectra; Atoms and ions with two or more electrons; Spectral line shapes, widths and shifts; Spectral continuum radiation.

PB82-152380 Not available NTIS
National Bureau of Standards, Washington, DC.
A Relationship between Reversed-Phase C18 Liquid Chromatographic Retention and the Shape of Polycyclic Aromatic Hydrocarbons,
S. A. Wise, W. J. Bonnett, F. R. Guenther, and W. E. May. Sep 81, 9p
Pub. in Jnl. Chromatographic Science 19, p457-465 Sep 81.

A relationship between the shape, particularly the calculated length-to-breadth ratios, of polycyclic aromatic hydrocarbons (PAH) and their reversed-phase C18 liquid chromatographic (LC) retention is described. In general, when isomeric PAH are compared, the LC retention increases with increasing length-to-breadth ratio. Retention data and length-to-breadth ratios for 100 PAH are compared. The elution orders for methyl-substituted fluorenes, anthracenes, phenanthrenes, pyrenes, fluoranthenes, benzo(c)phenanthrenes, benz(a)anthracenes, chrysenes, and benzo(a)pyrenes are reliably predicted from the calculated length-to-breadth ratios.

PB82-152398 Not available NTIS
National Bureau of Standards, Washington, DC.
Disorder in the Crystal Structures of Phases I and II of Copolymers of Tetrafluoroethylene and Hexafluoropropylene,
J. J. Weeks, R. K. Eby, and E. S. Clark. Nov 81, 4p
Pub. in Polymer 22, p1496-1499 Nov 81.

X-ray diffraction patterns for oriented and unoriented copolymers of tetrafluoro-ethylene and hexafluoropropylene are presented. They show a transition between 229 and 256K for a copolymer with about 3.4 CF3 per hundred main chain carbon atoms. The lower temperature phase (II) appears to be similar to that of the homopolymer. A primary difference is the presence in the copolymer crystals of small random longitudinal displacements of the molecules caused by the CF3 groups. The displacements increase with increasing CF3 concentration. The higher temperature phase (I) is similar to that of the homopolymer with a difference again being the longitudinal disorder of the copolymer. The difference disappears at higher temperatures as longitudinal disorder is introduced thermally in the homopolymer. At 296K (phase I) the molecular stems in a copolymer with about 3.4 CF3 per hundred main chain carbon atoms are at an angle of 37.1 deg with respect to the normal to the basal plane of the lamellas. In phase II, this number is the same within the limits of error.

PB82-152463 Not available NTIS
National Bureau of Standards, Washington, DC.
Measurements of the Viscosity of Compressed Gaseous and Liquid Ethane.
Final rept.,
Dwain E. Diller, and John M. Saber. 1981, 10p
Pub. in Physica 108A, p143-152 1981.

The shear viscosity coefficient of compressed gaseous and liquid ethane has been measured at temperatures between 95 and 320 K and at pressures up to 30 MPa (4350 psia) with a torsionally oscillating quarts crystal viscometer. The estimated precision and accuracy of the measurements are about 1 percent and 2 percent respectively. The measurements have been compared with an equation previously proposed for calculating the viscosity of gaseous and liquid ethane. Differences between the equation and the measurements reported here are less than 6 percent. The largest differences are found at low temperatures and high pressures, and along a supercritical isotherm at 320 K (T approximately equal to 1.05 T(c).

PB82-152513 Not available NTIS
National Bureau of Standards, Washington, DC.
Pressure as an Important Variable in Thermogravimetric Studies of Polymer Degradations.
Final rept.,
Brian Dickens. 1981, 4p
Pub. in Proceedings of the European Symposium on Thermal Analysis (2nd), University of Aberdeen, United Kingdom, September 1-4, 1981, p219-222.

Application of the recently developed method of factor-jump thermogravimetry to the study of polymer degradation has provided monitoring of the apparent activation energy during the degradation of a single sample without the necessity of knowing the initial or final sample weight (except to relate the activation energy to extent of reaction). Investigation of the degradation of several polymers in vacuo and under an atmosphere of N2 has shown that bubbles formed in the polymers in vacuum are supressed under N2. The phenomenon is related to that of normal boiling.

PB82-152604 Not available NTIS
National Bureau of Standards, Washington, DC.
Laser Initiated Chain Reactions: A Generalized Extension to Complex Chemical Chain Systems,
D J. Nesbitt, and S. R. Leone. Nov 81, 11p
Contract DOE-EA-77-A-01-6010, Grant NSF-PHY79-04928
Sponsored in part by National Science Foundation, Washington, DC. Grant NSF-CHE79-11340.

Pub in Jnl. of Chemical Physics 75, n10 p4949-4959, 15 Nov 81.

The authors present a generalized extension of the detailed kinetic and experimental analysis for studying rapid gas phase chemical chain reactions initiated by short pulse laser photolysis.

PB82-152620 Not available NTIS
National Bureau of Standards, Washington, DC.
Excimer Laser Photolysis Studies of Transiational-to-Vibrational Energy Transfer,
F. Magnotta, D. J. Nesbitt, and S. R. Leone. Oct 81, 5p
Grants NSF-PHY79-04928, NSF-CHE79-11340
Pub. in Chemical Physics Letters 83, n1 p21-25 Oct 81.

A new technique is presented to study translation-to-vibrational (T-V) energy transfer and translationally enhanced reactive events. The method utilizes excimer laser photolysis to produce translationally 'hot' atoms and time-resolved infrared detection of specific excited states.

PB82-152745 Not available NTIS
National Bureau of Standards, Washington, DC.
Time Correlation Functions and Molecular Motions in Glasses,
Raymond D. Mountain. 1981, 9p
Pub. in Annals of the New York Academy of Sciences 371, p252-260 1981.

The value of time correlation functions as a way to represent molecular motions in liquids and glasses will be illustrated by examining examples involving computer simulations, infrared absorption and dielectric relaxation and light scattering. A computer simulation is used to produce self-diffusion coefficient and the velocity autocorrelation function of a supercooled liquid state and a glassy state of a model of rubidium. With the accuracy of the simulation, in the self-diffusion coefficient of the glass is zero, indicating the need for special initial conditions to study the dynamics of diffusion in glass by molecular dynamics simulations. Various aspects of orientational motions are probed by infrared absorption, dielectric relaxation and depolarized light scattering. The connections of these three probes are examined with emphasis on depolarized light scattering. Experimental work on boron trioxide glass and supercooled benzel-benzoate are discussed within the framework of 'lower order' theory. This set of measurements illustrates the role of structural relaxation in governing the reorientation of molecules in supercooled liquids.

PB82-152752 Not available NTIS
National Bureau of Standards, Washington, DC.
Radical Redistribution of the 4d Oscillator Strength Observed in the Photoabsorption of the Ba, Ba+, and Ba++ Sequence,
T. B. Lucatorto, T. J. McIlrath, J. Sugar, and S. M. Younger. Oct 81, 5p
Pub in Physical Review Letters 47, n16 p1124-1128, 19 Oct 81.

The vacuum ultraviolet absorption spectra of isolated Ba, Ba(+1), and Ba(+2) have been measured. In Ba and Ba(+1) most of the 4d absorption oscillator strength is in the continuum, but in Ba(+2) several very strong discrete transitions are observed. Such behavior has never before been observed in the 4d photoabsorption of vapors, solids, or compounds. An interpretation is given in terms of the partial collapse of the nf bound state in Ba(+2).

PB82-152778 Not available NTIS
National Bureau of Standards, Washington, DC.
Automatic Karl Fischer Titration of Moisture in Grain,
Frank E. Jones, and Carroll S. Brickenkamp. 1981, 7p
Pub. in Jnl. of the Association of Official Analytical Chemists 64, n6 p1277-1283 1981.

Automatic Karl Fischer titrators of the motor-driven buret type and the coulometric generation type were applied to the determination of moisture in grain. Techniques were developed to optimize the performance of the Karl Fischer titration method and to overcome disadvantages attributed to it. It is suggested that the method be designated as the primary reference method for grain in general and for corn and soybeans in particular.

PB82-152786 Not available NTIS
National Bureau of Standards, Washington, DC.
Determination of Water in Solids by Automatic Karl Fischer Titration,
Frank E. Jones. Oct 81, 3p
Pub. in Analytical Chemistry 53, n12 p1955-1957 Oct 81.

Techniques have been developed to optimize the performance of automatic Karl Fischer reagent titrators in the determination of water in solids. Water is extracted from the material by methanol in a mixer/mill; the methanol-extracted H2O mixture is introduced volumetrically from a calibrated syringe into the titration vessel. The titrators (of the coulometric generation type and the motor-driven buret type) are standardized with distilled H2O. An analysis has been made of the sources and estimated magnitudes of the uncertainties in the determination of H2O. For solid material with a moisture content (% H2O) of 15%, the imprecision (standard deviation of the mean) is estimated to be 0.4% relative and the systematic uncertainty is estimated to be plus or minus 0.4% relative.

PB82-153370 PC **A05**/MF **A01**
UOP, Inc., San Diego, CA. Fluid Systems Div.
Development of High Salt Rejection Reverse Osmosis Membranes.
Final rept. 1 Jul 78-31 Dec 80,
C. E. Milstead, and R. L. Riley. 23 Jan 81, 78p W82-02109, OWRT-C-00163-D(7529)(1)
Contract DI-14-34-0001-7529

The objective of this three-phase program was to develop a high-salt rejection thin-film composite membrane for incorporation into 8- and 12-in. diam. x 4O-in. wide spiral-wound elements suitable for replacement elements for the 75 MGD Yuma Desalting Plant. Four types of thin-film composite membranes, prepared by interfacial polycondensation techniques on a fabric-reinforced porous polysulfone support, were evaluated. The optimum membrane, a polyamide, designated TFC-402, was successfully produced in large quantities for spiral-wound element fabrication. This membrane, yielding 22-25 gal/ft 2-day and greater than 99% TDS rejection from a Yuma Plant 70% recovery brine at 400 psi applied pressure, was fabricated into 21/2, 4-, 8-, and 12-in. diam. x 40in. wide elements for field testing at the OWRT Test Facility at Roswell, N.M. Testing of the 8- and 12-in. elements, prior to shipment to Roswell, in San Diego on a 4500 ppm TDS brackish well water feed showed that both element types gave about 99% rejections with high product fluxes.

PB82-153396 PC **A05**/MF **A01**
Permutit Co., Inc., Paramus, NJ.
Non-Acid Pretreatment and Management of Microorganisms in Seawater Desalination by Reverse Osmosis,
A. B. Mindler. 12 Nov 81, 99p W82-02108, OWRT-C-00093-D(0466)(1)
Contract DI-14-34-0001-0466

Non-acid pretreatment was studied in a seawater reverse osmosis pilot plant for one year with particular attention to biological aspects. Pretreatment of the tropical surface seawater by in-line coagulation/filtration reduced the Silt Density Index (SDI) consistently below 3.0 in the polishing filter effluent. Subsequent biological activity of periphytic organisms on piping surfaces after addition of organic antiscalants increased SDI by one unit or more. Slough-off of the organisms' polysaccharide sheaths resulted in fouling of the hollow fiber permeators. A 2000 hour run was made with 3 ppm polyacrylate antiscalant at ambient pH of 7.9 on one RO system in parallel with another system at pH 7.5, reduced by addition of 15 ppm sodium bisulfite. A 3000 hour run was made with Quebracho tannin as combined antiscalant/antifoulant under similar conditions. For the last 1500 hours tannin was employed in place of starvation chlorination for intake protection. Both polyacrylate and tannin antiscalants were found to serve as nutrient for bacterial growth and both impaired RO performance. Tannin uniquely decreased the attachment ability of periphytic bacteria. No hard scale was found during autopsy, but a small amount of amorphous calcium salt was detected in potted fiber ends of the permeators and in piggyback spiral wound elements. Analyses of foulants are reported.

PB82-154782 PC **A02**/MF **A01**
Environmental Monitoring and Support Lab.-Cincinnati, OH.
Trace Analyses for Wastewaters.
Journal article,
John A. Glaser, Denis L. Foerst, Gerald D. McKee, Stephen A. Quave, and William L. Budde. Jan 82, 12p EPA-600/J-81-241
Pub. in Environmental Science and Technology, p1426-1435 1981.

The concept and theory of method detection limit are developed in detail. Applications of the method detection limit to the analysis of organics by the EPA 600 series methods are presented with an interpretation of the results.

PB82-154873 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Yttrium-89 NMR: A Possible Spin Relaxation Probe for Studying Metal Ion Interactions with Organic Ligands.
Journal article,
George C. Levy, Peter L. Rinaldi, and J. Terry Bailey. 14 Nov 79, 9p EPA-600/J-80-376
Grant EPA-R-804916
Pub. in Jnl. of Magnetic Resonance 40, p167-173 1980.

The spin-lattice relaxation mechanisms for aqueous and dimethyl sulfoxide solutions of Y(NO3)3 have been found to be mainly spin-rotation and dipolar relaxation with solvent protons, unlike most heavy spin=1/2 metal ions which are relaxed mainly by spin-rotation and chemical shift anisotropy. The theoretical maximum (89)Y((1)H) NOEF value of -10.2 was observed when tau (c) for the ion was lengthened by lowering the temperature of the aqueous salt solution to 5C, or when yttrium was complexed to an organic ligand. Since (89)Y has a sensitivity of 0.67 relative to that of (13)C, the relative importance of dipolar relaxation and the large theoretical maximum NOEF make (89)Y a possible value NOE structure probe. Such studies can complement relaxation and shift data obtained from other diamagnetic and paramagnetic lanthanid ions.

PB82-154881 PC **A02**/MF **A01**
Alabama Univ. in Birmingham.
Conformational Flexibility of Bleomycin-A2: A Carbon 13 Spin-Lattice Relaxation Time Study.
Journal article,
N. R. Krishna, Jerry L. Dallas, Ed S. Mooberry, Ted T. Sakai, and Richard C. Allen. 29 Sep 78, 10p EPA-600/J-78-191
Grant EPA-R-804916
Pub. in Biochemical and Biophysical Research Communications, v85 n1 p363-370, 14 Nov 78. Prepared in cooperation with North Carolina Agricultural and Technical State Univ., Greensboro, and Florida State Univ., Tallahassee.

The extent of segmental motion of the backbone and sidechain carbons of the glycopeptide antibiotic, bleomycin-A(2) in aqueous solution, has been determined from the natural abundance carbon-13 spin-lattice relaxation times T(1) measured at 67.89 MHz. The backbone carbons of the central residues have an average T(1) of 163 msec, corresponding to an isotropic rotational correlation time of 3.9 x 10 to the -10 power sec. The backbone and sidechain carbons exhibit varying degrees of motional freedom. The solution conformation of bleomycin-A(2) is discussed in terms of the conformational flexibility available to these carbons.

PB82-154899 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Aqueous Relaxation Reagents in Nitrogen-15 NMR.
Journal article,
James J. Dechter, and George C. Levy. 20 Oct 79, 11p EPA-600/J-80-377
Grant EPA-R-804916
Pub. in Jnl. of Magnetic Resonance 39, p207-215 1980.

Electron-nuclear relaxation times T(1)supe's for 15N and 13C in natural abundance are measured for a series of amines in aqueous solution using Gd(III) complexes of a series of polyaminocarboxylate ligands as paramagnetic relaxation reagents (PARRs). The PARRs are classified by their predominant mode of interaction with the amine substrates (i.e. specific or non specific). The specific PARRs are evaluated qualitatively as NMR spin labels through their selectivity as measured by 15N T(1)supe's toward substrates of different Lewis base strength and through the degree of scalar line broadening induced in the substrate resonances. Additionally, the aqueous PARRs are com-

pared with better characterized nonaqueous PARRs, Cr(acac)3 and Gd(dpm)3. It is concluded that the diethylenetriaminepentaacetic acid complex, Gd(DTPA)(-2), is a satisfactory specific PARR and NMR spin label. The triethylenetetraaminehexaacetic acid complex, Gd(TTHA)(-3), is shown to be a useful non specific PARR although it is a charged complex; the presence of charged groups in substrates results in weak spin label effects. Finally, the behavior of these PARRs is contrasted with that of hydrated transition metal and lanthanide ions.

PB82-154931 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC. Environmental Toxicology Div.
Polychlorinated Biphenyls in Indoor Air.
Journal article,
Kathryn E. MacLeod. 4 May 81, 5p EPA-600/J-81-511
Pub. in Environmental Sciences and Technology 15(8), p926-928 Aug 81.

Polychlorinated biphenyls (PCBs) have been recognized as environmental contaminants since the mid-1960s. Until recently, however, little work has been done on identifying levels of PCBs in the indoor air. This paper describes a method for the analysis of PCBs utilizing low-volume indoor air sampling. The method uses polyurethane foam as a collector and has a limit of detection of about 0.01 micrograms/cu m. This study shows that indoor air whether in commercial, industrial, or residential buildings, contains levels of PCBs at least 1 order of magnitude higher than outdoor levels. Defective fluorescent light ballasts are also shown to emit PCBs and to be an important source of indoor atmospheric contamination.

PB82-155243 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Interpretation of Complex Molecular Motions in Solution. A Variable Frequency Carbon-13 Relaxation Study of Chain Segmental Motions in Poly(n-alkyl methacrylates).
Journal article,
George C. Levy, David E. Axelson, Robert Schwartz, and Jiri Hochmann. 11 May 77, 18p EPA-600/J-78-194
Grant EPA-R-804916
Pub. in Jnl. of the American Chemical Society 100(1), p410-424 1978.

An extensive variable temperature study of poly(n-butyl methacrylate) and poly(n-hexyl methacrylate) at two widely separated frequencies (67.9 and 22.6 MHz) has revealed that a model requiring a nonexponential autocorrelation function, or, its mathematical equivalent, a distribution of correlation times, describes the NMR parameters obtained for the backbone carbons. However, frequency-dependent spin-lattice relaxation time (T(1)) and nuclear Overhauser effect (NOE) behavior observed for all side-chain carbons, including the terminal methyls, with NT(1)s of the order of 20s, could not be described in terms of present theoretical approaches. A new model developed retains the distribution of correlation times for the backbone carbons and incorporates the effects of multiple internal rotations about the carbon-carbon single bonds for the side-chain carbons. This model predicts a substantial frequency dependence for broad distribution widths which can quantitatively reproduce almost all of the observed data. For the highest temperatures attained (about 110C) the observed T(1) frequency dependence is quite large and only semiquantitatively accounted for using this modified theory. The ramifications of multifrequency experiments with respect to the proper interpretation of complex motions are explored.

PB82-155250 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Quantitative 15N NMR Spectroscopy.
Journal article,
George C. Levy, T. Pehk, and P. R. Srinivasan. 1980, 6p EPA-600/J-80-380
Pub. in Organic Magnetic Resonance, v14 n2 p129-132 1980.

Line intensities in 15N NMR spectra are strongly influenced by spin-lattice and spin-spin relaxation times, relaxation mechanisms and experimental conditions. Special care has to be taken in using 15N spectra for quantitative purposes. Quantitative aspects are discussed for the 15N NMR of molecules with different nitrogen functional groups and also mixtures of nitrogen-containing compounds. It is shown that, in general, quantitative data are obtainable from integration of 15N lines in proton decoupled 15N NMR spectra using NOE suppression. Addition of paramagnetic relaxation reagents (PARR) under controlled conditions is frequently needed to accomplish the experiment within reasonable time limits.

PB82-155268 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Natural Abundance 13C NMR Spectroscopy of Double-Stranded DNA.
Journal article,
Randolph L. Rill, Peter R. Hillard, Jr., J. Terry Bailey, and George C. Levy. 25 Jul 79, 5p EPA-600/J-80-381
Grant EPA-R-804916
Pub. in Jnl. of the American Chemical Society, v102(1) p418-420 1980.

Although 13C NMR spectroscopy has already proved extremely useful in studies of biopolymers, including t-RNA's, and single-stranded polynucleotides, no successful study of native double-stranded DNA has been reported. This failure is mainly due to extremely unfavorable 13C spin relaxation parameters (very short T2's and long T1's) expected for the long and relatively rigid chains of typical DNA preparations.

PB82-155284 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
A Multinuclear NMR Spin Labeling Investigation of the Solution Structure of the Base Stacked Mn(+2) -AMP Complex.
Journal article,
George C. Levy, and James J. Dechter. 24 Aug 79, 8p EPA-600/J-80-379
Grant EPA-R-804916
Pub. in Jnl. of the American Chemical Society, v102 n20 p6191-6196 1980.

(15)N, (13)C, and (31)P electron-nuclear relaxation times are used to determine the solution structure of the base stacked Mn(+2) -AMP complex. The nitrogen-Mn(+2) distances that are determined indicate a direct inner-sphere coordination of Mn(+2) at N(1), N(7), and the amino NH2 positions. The phosphorus-Mn(+2) distance also indicates direct coordination and this second site may explain the anomalously short Mn(+2) -C(8) distance that is found. A structure is proposed consistent with the measured distances. Comparison of Mn(+2) -carbon distances with those in the literature is made.

PB82-157728 PC **A15**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Physical Sciences and Engineering.
NIOSH Manual of Analytical Methods: Volume 6.
Aug 80, 330p
See also Volume 1, Part 1, 2nd Edition, PB-274 845.

Guidelines for monitoring 35 toxic substances found in the workplace are presented. The apparatus requirements, standard deviation expectations, materials handling, sample preparation, reagent selection, calculations, interference problems, and other considerations pertinent to chemical analysis are described.

PB82-157942 PC **A05**/MF **A01**
Coury and Associates, Inc., Lakewood, CO.
An Experimental Project to Determine the Parameters of Silica Scaling in Reverse Osmosis Systems.
Technical completion rept.,
Michael C. Mickley, and W. Martin Straley. Apr 81, 85p W82-02451, OWRT-C-90169-S(9526)(1)
Contract DI-14-34-0001-9526

The objective of this work was to better define, on the basis of literature research and laboratory experiments in glassware and small reverse osmosis systems, how various parameters affect the concentration limits at which silica scaling occurs, and what the mechanisms of scaling are. The specific parameters studied were silica supersaturation, temperature, pH, and brine composition and concentration. Silica chemistry was found to be extremely complex, involving several different silica species and several mechanisms for removal of silica from solution. In addition, a wide variety of parameters were found to have effects on silica scaling, by affecting solubility, scaling mechanism, the kinetics of the mechanism, or a combination of these. This report provides a conceptual model of the types of silica scaling which may occur, and the situations in which they may occur, and presents experimental data consistent with the model.

PB82-803941 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrochemical Methods of Chemical Analysis. 1976-1981 (Citations from the NTIS Data Base).
Jan 82, 240p
Supersedes PB80-815053, and NTIS/PS-79/1025. See also 1964-1975, NTIS/PS-77/0869.

Polarographic, potentiometric, voltametric, and coulometric techniques are covered, including electrochemical titrations, studies on ion elective electrodes are excluded. (This updated bibliography contains 233 citations, 43 of which are new entries to the previous edition.)

PB82-859497 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Zeolites in Catalysis. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Feb 82.
Feb 82, 218p
Supersedes PB81-855926.

Citations in this bibliography cover the preparation, properties, and activity of zeolites used as catalysts in chemical reactions and chemical apparatus. Topics include catalytic cracking, reduction, processing, and supports, and various catalytic effects of zeolites and zeolite-containing compounds for a wide variety of applications. (This updated bibliography contains 210 citations, 120 of which are new entries to the previous edition.)

PB82-862194 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nematic Liquid Crystals. April, 1977-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Apr 77-Feb 82.
Feb 82, 272p
Supersedes PB80-856925.

Research studies and articles cited in this bibliography discuss the optical and electrical properties, molecular structure, synthesis, applications, and testing of nematic liquid crystals. (This updated bibliography contains 299 citations, 99 of which are new entries to the previous edition.)

RI-133 PC **A02**/MF **A01**
Radievyi Inst., Leningrad (USSR).
Characteristics of Secondary Particles in Nucleus-Nucleus Interactions at 4.5 GeV/C Nucleon.
V. G. Bogdanov, N. A. Perfilov, V. A. Plyushchev, and Z. I. Solov'eva. 1980, 22p
In Russian.
U.S. Sales Only.

Photographic emulsion nuclei were bombarded by deuterons, alpha-particles and carbon nuclei with momenta of 4.5 GeV/c per nucleon. Inelastic interaction characteristics, such as average multiplicities, their correlations, angular and energy distributions were studied as functions of the degree of target disintegration and of the mass of incident nucleus. Results were compared those for the case of proton-nuclear interactions. (Atomindex citation 12:603984)

7E. Radio and Radiation Chemistry

AD-A109 062/0 PC **A02**/MF **A01**
University of Southern California, Los Angeles. Dept. of Chemistry.
Evidence for the Intermediacy of 1,1-dimethyl-2-phenyl-1-sila-1,3-butadiene in the Photochemistry and Pyrolysis of 1,1-dimethyl-2-phenyl-1-sila-2-cyclobutene,
Dongjaw Tzeng, Raymond H. Fong, H. S. Dilanjan Soysa, and William P. Weber. 29 Apr 81, 10p
AFOSR-TR-81-0827
Grant AFOSR-80-0006
Pub. in Jnl. of Organometallic Chemistry, v219 p153-161 1981.

No abstract available.

AD-A109 383/0 PC **A03**/MF **A01**
Texas Univ. at Austin. Dept. of Chemistry.
Photoassisted Reactions on Doped Metal Oxide Particles.
Technical rept. 1 Jan-31 Dec 81,
J. M. White. 31 Dec 81, 28p Rept no. TR-21
Contract N00014-75-C-0922

Photoassisted reactions involving doped metal oxide semiconductor powders are reviewed. The mechanisms, insofar as they are now understood, are discussed for several reactions involving gas phase water near its equilibrium vapor pressure in contact with the oxide. Experimental results are presented along with some discussion of how these processes may be involved with heterogeneous processes in the atmosphere. (Author)

JINR-R-1-80-539 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Measurement of Residual Polarization of Negative Muons in Gaseous Hydrogen.
V. M. Bystritskii, V. P. Dzhelepov, V. G. Zinov, A. I. Rudenko, and L. N. Somov. 1980, 16p
In Russian.
U.S. Sales Only.

The residual polarization of negative muons in the ground state of Psub(mu)- and d mu - atoms has been measured in experiments with a gaseous target filled with ultrapure hydrogen up to 40 atm on a muonic beam of the 680 MeV JINR synchrocyclotron. The values of residual polarization in protium Psub(mu)(H)=0.3+-9% and deuterium Psub(mu)(D)=1.0+-0.9% have been obtained. Experimental estimation of Psub(mu)(H) is consistent with the value calculated and does not contradict the statement that a muon practically loses its polarization, already in an excited state of psub(mu)-atom. Estimation of Psub(mu)(D) is in a poor agreement with calculations and experimental data indicating relatively weak effect of the process of exchange collisions of dsub(mu)-atoms with deuterons for gaseous deuterium. But this value is close to the calculated one found earlier. (Atomindex citation 12:602896)

JINR-R-2-80-38 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Redetermination of the Adiabatic Basis in the Three-Body Problem with the Coulomb Interaction.
M. Kaschiev, and A. V. Matveenko. 1980, 11p
In Russian.
U.S. Sales Only.

An attempt has been made to redetermine the adiabatic basis in the three-body problem which interact in accordance with Coulomb law by introducing a part of adiabatic corrections into the Hamiltonian of two-center problem. In this basis the dissociation limit of the corresponding molecule (energy of isolated atom) is expressed by the one-state approximation. This is important for the setting up of boundary conditions for the Schroedinger equation. The coupling energy is calculated in the one-state approximation for eee exp + and pp mu exp - molecules. The comparison with analogous calculations in the classical approach are presented. (Atomindex citation 11:566584)

JINR-R-4-13046 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Relativistic Corrections and Corrections for Electromagnetic Nuclear Structure to Energy Levels of mu -Mesic Molecules.
D. D. Bakalov. 1980, 17p
In Russian.
U.S. Sales Only.

mu -mesic molecules of hydrogen isotopes are considered as a system of three spin particles with electromagnetic interaction. An effective Hamiltonian of the system is constructed, taking account of particle electromagnetic structure and relativistic effects of alpha exp 2 order, which do not depend on particle spin orientation. A scheme of excitation theory is suggested, which applies nonrelativistic three-body problem solution with coulomb potential, built in the adiabatic approach for calculation of relativistic and connected with particle finite sizes of energy level shifts. With 10 exp -3 eV accuracy calculated are errors for energy levels of all the known stationary mu -mesic molecule states of pp mu , dd mu , tt mu hydrogen isotopes and other three-body pd mu , pt mu , dt mu systems. Relative contributions of the investigated effects are discussed. (Atomindex citation 11:566585)

N82-14357/9 PC **A02**/MF **A01**
Toronto Univ. (Ontario). Dept. of Chemistry.
Modelling of Polymer Photodegradation for Solar Cell Modules.
Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1981.
A. C. Somersall, and J. E. Guillet. Apr 81, 17p NASA-CR-165041, JPL-9950-615
Contract JPL-955591

A computer model including an integration routine was developed and demonstrated to simulate, in principle, the chemical changes which may occur in the photooxidation of hydrocarbons, using as input data a set of elementary reactions, corresponding rate constants and appropriate starting conditions. Application of this model to the photooxidation of pottant and plastic materials used in the LSA module designs provides a reliable predictive capability regarding the useful lifetime of these materials. An earlier mechanism consisting of 46 reactions was simplified considerably by reducing the number of formal termination steps since it became apparent that the major termination process goes via the peroxy radicals. In addition, new reactions of oxygen with acryl radicals (from Norrish type I) to form peracids, which then decompose to form carbon dioxide are included.

N82-14358/7 PC **A02**/MF **A01**
Toronto Univ. (Ontario). Dept. of Chemistry.
Modelling of Polymer Photodegradation for Solar Cell Modules.
Quarterly Technical Progress Report, 1 Apr. - 30 Jun. 1981.
A. C. Somersall, and J. E. Guillet. Jul 81, 16p NASA-CR-165040, JPL-955591-81/3
Contract JPL-955591

A computer program developed to model and calculate by numerical integration the varying concentrations of chemical species formed during photooxidation of a polymeric material over time, using as input data a choice set of elementary reactions, corresponding rate constants and a convenient set of starting conditions is evaluated. Attempts were made to validate the proposed mechanism by experimentally monitoring the photooxidation products of small liquid alkane which are useful starting models for ethylene segments of polymers like EVA. The model system proved in appropriate for the intended purposes. Another validation model is recommended.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-A108 840/0 PC **A03**/MF **A01**
Washington Univ., Seattle. Fisheries Research Inst.
Community Structure and Standing Stock of Epibenthic Zooplankton at Five Sites in Grays Harbor, Washington.
Final rept. for period ending 7 May 81,
Jeffery R. Cordell, and Charles A. Simenstad. Sep 81, 37p Rept no. FRI-UW-8120
Contract DACW67-PO-R-0009
Report on Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies.

Using a suction pump, epibenthic zooplankton community structures and standing stock were measured in shallow sublittoral and middle littoral habitats at Cow Point, Moon Island, the Marsh Establishment Site, and Stearn's Bluff, and the lower littoral habitat of a site opposite the channel from Moon Island in Grays Harbor on 7 May 1981. Numerically and gravimetrically dominant organisms included harpacticoid copepods, primarily ectinosomids, and larvae and adult calanoid copepods, particularly Eurytemora americana and Acartia clausi. Density and standing crop were somewhat higher at the 0.00-m tidal elevations than at +2.1-m, except at the Marsh Establishment Site, where both density and standing crop were higher at +2.1-m. It was hypothesized that this relationship reflected the increased tidal and current velocities present at closer proximity to the navigation channel. Habitat disruption or removal associated with widening the navigation channel could potentially impact important prey resources of juvenile chum and chinook salmon and English sole, particularly at Moon Island, where the proportion of available fish foraging habitat in the shallow sublittoral zone is greater than at Stearn's Bluff. (Author)

AD-A109 397/0 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Oceanography.
Natural Physical Disturbances and Communities of Marine Soft Bottoms.
David Thistle. 31 Jul 81, 8p Rept no. 187
Contract N00014-75-C-0201
Pub. in Marine Ecology - Progress Series, v6 p223-228, 15 Oct 81.

No abstract available.

NUREG/CR-1939-V4 PC **A04**/MF **A01**
Lehigh Univ., Stone Harbor, NJ. Wetlands Inst.
Ecological Studies of Wood-Boring Bivalves in the Vicinity of the Oyster Creek Nuclear Generating Station: Progress Report June-August 1981.
Quarterly progress rept. 1 Jun-31 Aug 81,
K. E. Hoagland, and L. Crocket. Jan 82, 52p
See also report for Dec-Feb 81, NUREG/CR-1939-V2.

The species composition, distribution, and population dynamics of wood-boring bivalves are being studied in the vicinity of the Oyster Creek Nuclear Generating Station, Barnegat Bay, New Jersey. Untreated wood test panels are used to collect organisms at 12 stations. Physiological tolerances of 3 species are also under investigation in the laboratory. Competition among the species is being analyzed. In the summer of 1981, Teredo bartschi occurred in large numbers at one station in Oyster Creek, but did not appear in significant numbers in Forked River.

PB82-146218 PC **A06**/MF **A01**
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Census of Northern Sea Lion ('Eumetopias jubatus') in Central Aleutian Islands, Alaska, 17 June-15 July 1979, with Notes on Other Marine Mammals and Birds.
Technical memo.,
Clifford H. Fiscus, David J. Rugh, and Thomas R. Loughlin. Oct 81, 117p NOAA-TM-NMFS-F/NWC-17, NOAA-81103013

A summary of a survey of northern sea lion Eumetopias jubatus in the central Aleutian Islands, Alaska, from 17 June to 15 July 1979 is presented. A total of 46,359 sea lions including 2,413 bulls and 5,417 pups were counted. A summary count for the entire Aleutian Islands from the present study and other recent surveys is 89,113. Counts of other marine mammals from the present survey include: 3,170 sea otter, 674 harbor seal, 7 northern fur seal, 43 minke whale, 1 fin whale, 3 other rorquals, 63 killer whale, 16 harbor porpoise, 470 Dall's porpoise, 54 beaked whale, plus 7 unidentified whale.

PB82-153685 PC **A05**/MF **A01**
Delaware Univ., Newark. Coll. of Marine Studies.
Phytoplankton Production and Community Composition in a Marsh-Dominated Estuary Which Receives Sewage Waste.
Technical completion rept. Oct 80-Sep 81,
Franklin C. Daiber, and Edward M. Simek, Jr. Oct 81, 83p W82-02179, OWRT-A-052-DEL(1)
Contract DI-14-34-0001-1108

An investigation of the Murderkill River estuary, Delaware was conducted to describe the phytoplankton community, measure phytoplankton production and evaluate this production relative to other sources of organic carbon. Phytoplankton cell counts were highest in March, decreased to low levels by July, then in-

creased and remained fairly uniform at high levels throughout late summer, autumn, and winter. The community was dominated by diatoms in winter and spring, and small microflagellates in late summer and early autumn. Phytoplankton production averaged 380 gC/sq m/yr, and the average water column respiration rate was 280 gC/sq m/yr. During the year, phytoplankton produced an estimated 340 million grams of organic carbon, but water column respiration required 250 million grams of organic carbon. A shallow eutrophic zone appeared to limit phytoplankton production.

PB82-154030 PC **A07**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
An Illustrated Guide to Tidal Marsh Plants of Mississippi and Adjacent States,
Lionel N. Eleuterius. c1981, 133p MASGP-77-039, NOAA-81111614
Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, MS.Color illustrations reproduced in black and white.

This field guide has been prepared for individuals with some knowledge of plants and covers 200 plant species which inhabit the tidal marshes of Mississippi. The handbook contains all the major or most abundant plant species composing the vegetation of local tidal marshes and many that are infrequently found. A few plant species included are relatively rare. Illustrations and written descriptions for three fern species, one gymnosperm, 89 monocots, 107 dicots are included. Sixty-three (63) plant families, including 122 genera are arranged phylogenetically by family and alphabetically by genus.

PB82-154816 PC **A02**/MF **A01**
Charleston Coll., SC. Grice Marine Biological Lab.
Seasonal Changes in the Amphipod Fauna of 'Microciona prolifera' (Ellis and Solander) (Porifera: Demospongia) and Associated Sponges in a Shallow Salt-Marsh Creek.
Journal article,
Charles K. Biernbaum. Jun 81, 12p CONTRIB-51, EPA-600/J-82-491
Grant EPA-R-804688
Pub. in Estuaries, v4 n2 p85-96 Jun 81.

Between September 1976 and August 1978, samples of four species of sponge, Microciona prolifera, Haliclona loosanoffi, Lissodendoryx, and Halichondria bowerbanki were collected from subtidal shell debris in a North Edisto River, South Carolina saltmarsh creek and associated amphipods identified. Seasonal changes in amphipod dominance were however approximately the same in all sponge species.

PB82-156266
(Order as PB82-156258, PC **A09**/MF **A01**)
Washington Univ., Seattle. Coll. of Fisheries.
The Osteology and Relationships of the Anglerfish Genus 'Tetrabrachium' with Comments on Lophiform Classification,
Theodore W. Pietsch. Feb 81, 34p CONTRIB-561, NOAA-81111603-1
Grants NSF-DEB76-82279, NSF-DEB78-26540
Sponsored in part by National Science Foundation Grant NSF-DEB80-05064.
Included in Fishery Bylletin, v79 n3 p387-419 1981.

The shallow-water anglerfish, Tetrabrachium ocellatum, now represented by 36 specimens from Australian, New Guinean, and Indonesian waters, is redescribed and compared osteologically with its allies within the Antennarioidei. Phylogenetic analysis based on a search for shared, derived characters shows that Tetrabrachium is most closely related to Antennarius, and is classified on this basis as a sister-family of the Antennariidae.

PB82-156274
(Order as PB82-156258, PC **A09**/MF **A01**)
National Marine Fisheries Service, Auke Bay, AK. Auke Bay Lab.
Early Zoeal Stages of 'Lebbeus polaris, Eualus suckleyi, E. fabricii, Spirontocaris arcuata, S. ochotensis, and Heptacarpus camtschaticus' (Crustacea, Decapoda, Caridea, Hippolytidae) and Morphological Characterization of Zoeae of 'Spirontocaris' and Related Genera,
Evan Haynes. Mar 81, 21p NOAA-81111603-2
Included in Fishery Bulletin, v79 n3 p421-440 1981.

Stage I and II zoeae of Lebbeus polaris, Eualus suckleyi, and E. fabricii and Stage I zoeae of Spirontocaris arcuata, S. ochotensis, and Heptacarpus camtschaticus are described from individuals of known parentage. Larval development of L. polaris is more abbreviated than larval development of other hippolytid shrimp.

PB82-156282
(Order as PB82-156258, PC **A09**/MF **A01**)
West Virginia Univ., Morgantown. Dept. of Biology.
Feeding Behavior and Biology of Young Sandbar Sharks, 'Carcharhinus plumbeus' (Pisces, Carcharhinidae), in Chincoteague Bay, Virginia,
Robert J. Medved, and Joseph A. Marshall. Apr 81, 7p NOAA-81111603-3
Included in Fishery Bulletin, v79 n3 p441-447 1981.

During the summers of 1977, 1978, and 1979 the feeding behavior and biology of young sandbar sharks were investigated in Chincoteague Bay, Virginia, using catch data obtained from rod and reel fishing. Mean catch per unit effort for the study was 1.02 sharks per hour, but yearly differences in catch per unit effort were found.

PB82-156290
(Order as PB82-156258, PC **A09**/MF **A01**)
Northeastern Univ., Nahant, MA. Marine Science Inst.
Seasonal Changes in Soft-Body Component Indices and Energy Reserves in the Atlantic Deep-Sea Scallop 'Placopecten magellanicus',
William E. Robinson, William E. Wehling, M. Patricia Morse, and Guy C. McLeod. Apr 81, 11p NOAA-81111603-4
Sponsored in part by Department of Energy, Washington, DC.
Included in Fishery Bulletin, v79 n3 p449-458 1981.

The relationship between the energy storage cycle and gametogenesis was investigated over a 1-year period in a population of the Atlantic deep-sea scallop, Placopecten magellanicus, from Boothbay, Maine. Soft body component indices, dry weights, lipid and carbohydrate levels were measured in digestive gland, adductor muscle components, and gonadal tissue.

PB82-156308
(Order as PB82-156258, PC **A09**/MF **A01**)
Hokkaido Univ., Sapporo (Japan).
Effects of Photoperiod and Feeding on Daily Growth Patterns in Otoliths of Juvenile 'Tilapia nilotica',
Kuniaki Tanaka, Yasuo Mugiya, and Juro Yamada. Jan 81, 9p NOAA-81111603-5
Included in Fishery Bulletin, v79 n3 p459-466 1981.

Effects of varying photoperiods and feeding times on the formation of daily rings in otoliths of juvenile Tilapia nilotica were studied with a scanning electron microscope. Two alternate concentric zones, each different in structure, were distinguished in the acid-etched ground plane; one thin and appearing as a groove (discontinuous zone) and the other thick and with well-developed, needlelike crystals (incremental zone). The number of incremental zones showed a good correlation with the chronological age in days after hatching for at least 28 days. The otolith showed a daily rhythm of growth under a photoperiod of 24 hours.

PB82-156316
(Order as PB82-156258, PC **A09**/MF **A01**)
Alaska Dept. of Fish and Game, Anchorage.
Prey of the Steller Sea Lion, 'Eumetopias jubatus', in the Gulf of Alaska,
Kenneth W. Pitcher. Apr 81, Apr 81, NOAA-81111603-6
Included in Fishery Bulletin, v79 n3 p467-472 1981.

Stomach contents of 250 Steller sea lions, Eumetopias jubatus, collected in the Gulf of Alaska consisted by volume of 95.7% fishes, 4.2% cephalopods, less than 0.1% decapod crustaceans, less than 0.1% shelled-gastropods, and less than 0.1% mammals. The 10 top-ranked prey were walleye pollock.

PB82-156324
(Order as PB82-156258, PC **A09**/MF **A01**)
Virginia Cooperative Fishery Unit, Blacksburg.
Offshore Distribution of Alewife, 'Alosa pseudoharengus', and Blueback Herring, 'Alosa aestivalis', Along the Atlantic Coast,
Richard J. Neves. Apr 81, 14p NOAA-81111603-7
Included in Fishery Bulletin, v79 n3 p473-487 1981.

This study of the offshore distribution of alewife, Alosa pseudoharengus, and blueback herring, A. aestivalis, in the Atlantic Ocean was based on catch data collected over the 16-year period 1963-78 during bottom trawl surveys. All catches of the two species were made where bottom water temperatures ranged from 2 to 17C, and catches were most frequent at bottom temperatures between 4 and 7C. Most catches of both species were made at stations where depth was less than 100 m.

PB82-156332
(Order as PB82-156258, PC **A09**/MF **A01**)
Smithsonian Institution, Fort Pierce, FL. Fort Pierce Bureau.
The Complete Larval Development in the Laboratory of 'Micropanope sculptipes' (Crustacea, Decapoda, Xanthidae) with a Comparison of Larval Characters in Western Atlantic Xanthid Genera,
Bryan L. Andryszak, and Robert H. Gore. Jan 81, 21p CONTRIB-064, NOAA-81111603-8
Included in Fishery Bulletin, v79 n3 p487-506 1981.

The larval development in the laboratory of Micropanope sculptipes, a western Atlantic deepwater xanthid crab which inhabits encrusted and coralline substrates, is completely described and illustrated. Morphological characteristics of M. sculptipes zoeae and megalopa are compared with larval characteristics of several other western Atlantic xanthid species.

PB82-156365
(Order as PB82-156258, PC **A09**/MF **A01**)
Occidental Coll., Los Angeles, CA.
Growth, Reproduction, and Food Habits of Olive Rockfish, 'Sebastes serranoides', Off Central California,
Milton S. Love, and William V. Westphal. Mar 81, 14p NOAA-81111603-11
Grants NOAA-04-7-158-44121, NSF-OCE76-23301
Included in Fishery Bulletin, v79 n3 p533-545 1081.

The report contains data which was collected on age-length and length-weight relationships, age at first maturity, spawning season, fecundity, and food habits of olive rockfish, Sebastes serranoides, off Diablo Cove, near Avila, California.

PB82-156373
(Order as PB82-156258, PC **A09**/MF **A01**)
California Univ., Santa Barbara. Marine Science Inst.
Ovarian Cycling Frequency and Batch Fecundity in the Queenfish, 'Seriphus politus': Attributes Representative of Serial Spawning Fishes,
E. E. DeMartini, and Robert K. Fountain. Dec 80, 15p NOAA-81111603-12
Included in Fishery Bulletin, v79 n3 p547-560 1981.

Egg production by Seriphus politus near San Diego in southern California was studied during 1978-79. Spawning frequency was estimated on the basis of incidence of females with hydrated eggs. Estimates of annual egg production were an order of magnitude greater than estimates based on conventional methods. Seriphus politus spawns during March-August, and females mature at 10.0-10.5 cm standard length in their first spring or second summer following birth. Spawning is asynchronous among females, but has monthly peaks in intensity during the waxing (first quarter) of the moon. Fecundity is proportional to size and is better correlated with weight than with length of female.

PB82-156381
(Order as PB82-156258, PC **A09**/MF **A01**)
Whittier Coll., CA. Dept. of Biology.
Seasonal Spawning Cycle of the Black Croaker, 'Cheilotrema saturnum' (Sciaenidae),
Stephen R. Goldberg. Jul 81, 3p NOAA-81111603-13
Included in Fishery Bulletin, v79 n3 p551-562 1981.

Detailed information is lacking on the spawning cycle of the black croaker, Cheilotrema saturnum. Previous works have indicated spawning occurs in spring and summer. This report describes the histological changes occurring in the spawning cycle. Comparisons are made with the spawning cycles of two other sciaenid fishes.

PB82-156399
(Order as PB82-156258, PC **A09**/MF **A01**)
National Marine Fisheries Service, Seattle, WA.

Population Growth and Censuses of the Northern Elephant Seal, 'Mirounga angustirostris', on the California Channel Islands, 1958-78,
George A. Antonelis, Jr., Stephen Leatherwood, and Daniel ODell. Jul 81, 7p NOAA-81111603-14
Prepared in cooperation with Hubbs-Sea World Research Inst., San Diego, CA., and Miami Univ., FL. Rosenstiel School of Marine and Atmospheric Science.
Included in Fishery Bulletin, v79 n3 p562-567 1981.

The northern elephant seal, Mirounga angustirostris, has received considerable attention because of its dramatic recovery from near extinction in the late 19th century. One can trace a rapid increase in size of the California Channel Island subpopulation over the last nearly three decades. Using estimated pup production figures from this and other published censuses for the years 1958-78, rates of growth for each island are assessed within the subpopulation and for the subpopulation as a whole.

PB82-156415
(Order as PB82-156258, PC **A09**/MF **A01**)
Texas Univ. at Austin, Port Aransas. Port Aransas Marine Lab.
Effects of Temperature and Salinity on Egg Hatching and Larval Survival of Red Drum, 'Sciaenops ocellata',
Joan Holt, Robert Godbout, and C. R. Arnold. Jul 81, 6p CONTRIB-466, NOAA-81111603-16
Included in Fishery Bulletin, v79 n3 p569-572 1981.

The red drum, Sciaenops ocellata, is a sciaenid fish distributed along the eastern coast of North America from Massachusetts to southern Florida and along the Gulf coast at least as far south as Tampico, Mexico. The objective of this study was to determine the optimum temperatures and salinities for hatching and growth of red drum eggs and larvae.

PB82-157439 PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Marine Fisheries Review. Volume 43, Number 7, July 1981.
Jul 81, 36p NOAA-81120302
See also PB82-157447 thru PB82-157462 and Volume 41, Number 10, PB80-182223.

In addition to the usual sections, this issue contains the following articles: The biology, fisheries, and management of the Queen Conch, Strombus gigas; Habitat and nursery grounds of Pacific Rockfish, Sebastes spp., in rocky coastal areas of Southeastern Alaska; and Conditional fishery status as a solution to overcapitalization in the Gulf of Mexico shrimp fishery.

8B. Cartography

AD-A108 784/0 PC **A02**/MF **A01**
Defense Mapping Agency Inter American Geodetic Survey, Fort Sam Houston, TX.
Remote Sensing in Latin America: Technology and Markets for the 1980s,
Lawrence J. Jungman. Aug 81, 16p

A review is made on the impact of satellite derived remote sensing data in Latin America. Data availability has generated a phenomenal growth in the user community in Latin America, and new sensor systems planned and proposed are viewed as a further impetus to an increased market in the Americas. The international institutionalization of remote sensing interests in the area is an indicator submitted as a viable force in the continued, future market and transfer of technology. The availability of required training and funding for special projects by these institutions is reviewed. Proposals are made for special training to prepare for increased digital and cartographic applications that will be required in the expanded users market of the 1980s. (Author)

AD-A109 361/6 PC **A03**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Automatic Relocation of Ground Control Points in Landsat Imagery.
Technical rept.,
A. H. Benny. Jun 81, 37p RAE-TR-81071, DRIC-BR-80598

Images obtained from the Landsat multispectral scanner are not provided in any normally recognised map projection system, so it is often necessary for a transformation to be made. This is usually done with the aid of ground control points, whose locations on the ground (or on a map) are accurately known and which can be accurately located within Landsat images. The initial selection and location of such ground control points is usually performed manually. For repeat - ie multitemporal - imagery, the same ground control points can be used. The positions of these points can be relocated within the repeat image either manually or, as described in this paper, by an almost entirely automatic computer process. This process has been found to work speedily and effectively on many repeat images of Britain, usually giving accurate relocation of well over 90% of ground control points. The process has been developed for use with images of Britain, but it could readily be adapted for worldwide use. (Author)

AD-A109 366/5 PC **A02**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Computer-Assisted Photo Interpretation Research at USAETL,
George E. Lukes. 21 Apr 81, 14p Rept no. ETL-R028

A program in computer-assisted photo interpretation research (CAPIR) has been initiated at the U.S. Army Engineer Topographic Laboratories. In a new laboratory, a photo interpreter (PI) analyzing high-resolution, aerial photography interfaces directly to a digital computer and geographic information system (GIS). A modified analytical plotter enables the PI to transmit encoded three-dimensional spatial data from the stereomodel to the computer. Computer-generated graphics are displayed in the stereomodel for direct feedback of digital spatial data to the PI. Initial CAPIR capabilities include point positioning, mensuration, stereoscopic area search, GIS creation and playback, and elevation data extraction. New capabilities under development include stereographic superposition, a digital image workstation, and integration of panoramic Optical Bar Camera photography as a primary GIS data source. This project has been conceived as an evolutionary approach to the digital cartographic feature extraction problem. As a working feature extraction system, the CAPIR laboratory can serve as a testbed for new concepts emerging from image understanding and knowledge-based systems research. (Author)

8C. Dynamic Oceanography

AD-A108 759/2 PC **A04**/MF **A01**
Louisiana State Univ., Baton Rouge. Dept. of Civil Engineering.
Prediction of Surf Zone Characteristics.
Final rept. 1979-1981,
Joseph N. Suhayda, and Gerald F. McHugh. 4 Jul 81, 70p
Contract N00014-79-C-0342

This report presents the results of the development and testing of predictive models for computing surf zone characteristics from wave measurements made outside the surf zone. The surf zone characteristics predicted are average breaker height, maximum breaker height, average breaker position, maximum breaker position, breaker type, average longshore current and maximum longshore current. Preliminary field tests indicate breaker height prediction was within + or - 10% for wave heights of about 1 meter. (Author)

AD-A108 883/0 PC **A07**/MF **A01**
Woods Hole Oceanographic Institution, MA.
Drifting Vertical Current Meter, Moored Aanderaa Thermistor Chain, and XBT Data - JASIN 1978 ATLANTIS-II Cruise (102).
Technical rept.,
Nancy J. Pennington, and Robert A. Weller. Oct 81, 141p Rept no. WHOI-81-92
Contract N00014-76-C-0197, Grant NSF-OCE77-25803

Summaries are given of three data sets taken at and in the vicinity of the oceanographic moorings deployed in the 1978 Joint Air-Sea Interaction Project (JASIN). The data sets are: (1) the temperature, pressure and vertical motion records from the freely drifting Vertical Current Meters (VCMs) deployed from the ATLANTIS II, (2) the temperature data from the Aanderaa thermistor chains on W.H.O.I. mooring 653, designated as JASIN mooring W3, and (3) the expendable bathythermograph (XBT) data collected from the ATLANTIS II while participating in the JASIN Project.

AD-A108 942/4 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Visually Observed Wave Data at Pt. Mugu, California,
Christine Schneider, and J. Richard Weggel. 1979, 15p Rept no. CERC-R-81-12
Pub. in Proceedings of the International Coastal Engineering Conference (17th), ASCE, p381-393 Sydney, Australia, 23-28 Mar 80.

No abstract available.

AD-A109 117/2 Not available NTIS
Florida State Univ., Tallahassee. Geophysical Fluid Dynamics Inst.
Wind Generation of the Costa Rica Dome,
Eileen E. Hofmann, Antonio J. Busalacchi, and James J. O'Brien. 23 Dec 80, 4p Rept no. GFDI-CONTRIB-174
Contract N00014-80-C-0076, Grant NSF-ATM79-20485
Pacific Equatorial Ocean Dynamics Program Contribution No. 3.
Availability: Pub. in Science, v214 p552-554, 30 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14617/6 PC **A03**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
Project Noordwijk. Part 1: Measurements of the Radar Backscatter Coefficient gamma (Sigma Deg) in 1977 and 1978.
G. P. Deloor. Nov 79, 42p PHL-1979-49-PT-1, TDCK-73426

Radar backscatter measurements obtained from a sea platform are compared with airborne and spaceborne observations. A short range FM radar was mounted beside a television camera and directed into the prevailing winds. Upwind and crosswind data were collected, but downwind data are scarce, and more windspeed data are required. A systematic difference is observed between airborne and ground based data. The value of gamma is dependent on windspeed; dependency differs for the specular region (low incidence angles) and the diffuse (incidence angles ch110 45 deg).

N82-14618/4 PC **A05**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
Project Noordwijk. Part 2: Results of North Sea Clutter Measurements in the I-Band Performed from the Platform Noordwijk in September/October 1977.
H. Sittrop, and H. Gravesteijn. Aug 80, 79p PHL-1980-28-PT-2, TDCK-74302

Radar backscatter off the sea at low incidence angles was measured. A low frequency spectral analysis method is used to show that an appreciable periodic content exists in the sea return. This component in the scintillation spectra is 0.14 Hz and is related to the sea wave period. Wind-wave interaction effects are observed for up, down and crosswind directions. The clutter patch size and the incidence angle are used as a parameter. An optimum spectral response exists for upwind observations at an incidence angle of 1 deg and pulselength 0.08 microsec. The radar cross section per unit area measured is compared with an experimental sea clutter model. For wind directions resulting in an adequate fetch over open sea, reasonable agreement is found. No significant conclusions can be drawn with respect to megaripple observations.

N82-14692/9 PC **A07**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
Gravity Waves on Water with Non-Uniform Depth and Current.
Ph.D. Thesis.
N. Booij. 19 May 81, 130p

A mathematical model for the combined refraction-diffraction of linear periodic gravity waves on water is developed, in which the influence of inhomogeneities of depth and current is taken into account. The model is used to compute partial reflection of waves crossing a gully or an undersea slope, with influence of a current. The model is also applied to prismatic wave channels

with reflecting side-walls. For a gully bounded by shallows the model predicts the decay of wave height due to radiation of energy in lateral direction. For practical application in regions with arbitrary bottom and current topography a parabolic approximation of the model is derived. This is used as a basis for numerical calculation of waves in a sea region near the coast.

N82-14715/6 PC A09/MF A01
Technische Hogeschool, Delft (Netherlands).
The Directional Energy Distribution of Wind Generated Waves as Inferred from Stereophotographic Observations of the Sea Surface.
Ph.D. Thesis.
L. H. Holthuijsen. 28 May 81, 198p

Characteristics of the directional energy distribution of wind generated waves on the basis of observations with a relatively high resolution was determined. Approximately 75 observations are studied. They are selected from five spectra determined from stereophotographic observations of the sea surface. Three of these spectra were obtained in a so-called ideal generation situation. This is a situation where a homogeneous, stationary wind blows perpendicularly off a straight coast over deep water. The other two spectra were observed in similar situations. The difference with the ideal situation is for one spectrum that the wind was slanting across the coastline and for the other that the coastline was irregular. The observed distributions are compared with the model introduced by Longuet-Higgins et al. The differences between the observations and this model can be quantified due to the high resolution of the observations. It is found in the ideal situation that the model agrees well for most practical purposes with the observed distributions. In the other two situations it is found that the shape of the directional energy distribution is strongly influenced by the geometry of the upwind coastline.

N82-14789/3 PC A04/MF A01
Illinois Univ. at Urbana-Champaign. Radio Research Lab.
Remote Sensing of Sea State by Laser Altimeters.
B. Teal, and C. S. Gardner. Dec 81, 51p NASA-CR-165049, RRL-PUBL-514
Grant NSG-5049

The reflection of short laser pulses from the ocean surface was analyzed based on the specular point theory of scattering. The expressions for the averaged received signal, shot noise and speckle induced noise were derived for a direct detection system. It is found that the reflected laser pulses have an average shape closely related to the probability density function associated with the surface profile. This result is applied to estimate the mean sea level and significant wave height from the receiver output of the laser altimeter.

PB82-150384 PC A08/MF A01
National Oceanic and Atmospheric Administration, Seattle, WA. Pacific Marine Environmental Lab.
Guide to R2D2-Rapid Retrieval Data Display.
Technical memo.,
C. A. Pearson. May 81, 156p NOAA-TM-ERL-PMEL-29, NOAA-81102101

R2D2 is a set of Fortran programs, linked by a procedure file, for rapid retrieval and display of hydrographic, current meter, and pressure gauge data. Data are stored as random access disk files for rapid access and sorting. Programs are interactive and have graphics capability. A wide range of display and analysis outputs are available, including time series plots, data listings, statistics, spectral and tide analysis, empirical orthogonal function analysis, and maps of properties.

PB82-152349 PC A08/MF A01
Oregon State Univ., Corvallis. School of Oceanography.
A Compilation of Observations from Moored Current Meters. Volume XIII. Currents, Temperature and Pressure Southeast of New Zealand, April 1978-May 1980,
J. S. Bottero, H. L. Bryden, D. C. Root, and J. Simpkins, III. Jun 81, 159p ORESU-DR-88, REF-81-8, NSF/IDOE-81-89
Grant NSF-OCE77-22887
See also Volume 1, PB-173 933, and Volume 12, PB81-161515.

Observations were made southeast of New Zealand from April 1978 to May 1980 with the objectives of investigating the dynamics of low-frequency motions and their effects on the Antarctic Circumpolar Current; and the formation of subantarctic mode water on Campbell Plateau. Self-recording instruments were deployed during a 7-month period from April to November 1978, and during an 18-month period from November 1978 to May 1980. Measurements from these instruments are summarized in this report through statistical tables, progressive vector diagrams, real time plots, rotary and standard spectra, and stick figures.

8E. Geodesy

AD-A108 887/3 PC A04/MF A01
Ohio State Univ., Columbus. Dept. of Geodetic Science and Surveying.
A Simulation Study to Test the Prediction of 1 deg x 1 deg Mean Gravity Anomalies Using Least Squares Collocation from the GRAVSAT Mission,
Dhaneshwar P. Hajela. Sep 81, 62p 316, SCIENTIFIC-9, AFGL-TR-81-0302
Contract F19628-79-C-0027

The purpose of this simulation study was to test the accuracy of prediction of mean gravity anomalies from the GRAVSAT mission, to establish the resolution achievable in terms of anomaly block size, and to draw conclusions for the data requirement for economical processing in terms of computer time. It was foun that though the estimates of the formal standard deviation of the predicted 1 deg anomalies were reduced with the increase in size of the data cap, and with the increase in the density of data inside the cap, there was little improvement in the predicted value of 1 deg anomalies by least squares collocation technique. Besides, there was a large increase in the computer time required for the processing of the increased data.

AD-A108 880/8 PC A05/MF A01
Ohio State Univ., Columbus. Dept. of Geodetic Science and Surveying.
The Estimation of Free-Air Anomalies,
Hans Suenkel. Sep 81, 77p 315, SCIENTIFIC-9, AFGL-TR-81-0289
Contract F19628-79-C-0075

A prediction model of point and/or mean free-air anomalies, based on point values, is proposed. It relies on the concept of least-squares collocation with parameters. The model parameters are the two regression parameters of a linear model, which assumes a linear correlation between free-air anomaly and elevation. Particular emphasis is put on the role of the topography in mountainous areas. (Author)

AD-A108 999/4 PC A09/MF A01
Ohio State Univ., Columbus. Dept. of Geodetic Science and Surveying.
Theories of Nutation and Polar Motion II,
Helmut Moritz. Sep 81, 183p 318, SCIENTIFIC-8, AFGL-TR-81-0286
Contract F19628-79-C-0075
See also Rept. no. DGS-309, AD-A099 015.

The report describes and interrelates various theories of nutation and polar motion based on an earth model consisting of an elastic mantle and a liquid core. In order to make basic features transparent and to facilitate interrelation and intercomparison, the liquid core is considered homogeneous and incompressible. A detailed treatment of the theory of Molodensky serves as a basis for describing recent advances by Shen and Mansinha, Smith, Wahr, and others; an elementary treatment of the variational approach by Jeffreys and Vicente and a numerical comparison conclude the report. (Author)

AD-A109 144/6 PC A03/MF A01
Army Engineer Topographic Labs., Fort Belvoir, VA.
Error Statistics for Astrogeodetic Positions for an RGSS Test Course.
Research note,
Angel A. Baldini. Jul 81, 50p Rept no. ETL-0267

In the experimental mobile inertial survey system, geodetic parameters are measured relative to an origin point. Certain errors build up along the survey course. Typically, these errors are adjusted and distributed both during and after completing each mission. During testing, the adjusted derived data are compared with 'known' data that are determined by conventional 'classical' surveys. In its research, ETL requires a more accurate adjustment of errors obtained from conventional methods. The approach to the problem involved evaluating and analyzing the various error sources in the conventional data recalculation of certain data by new methods and developing a new statistical error treatment that applies not only to the objectives of this in-house research, but to the general application of inertial geodetic systems. In this report, a new statistical error procedure has been developed to improve geodetic positions that are useful in ETL's core program of RGSS tests and in any future tests of inertial systems. (Author)

AD-A109 364/0 PC A03/MF A01
Royal Aircraft Establishment, Farnborough (England).
Geopotential Harmonics of Order 29, 30 and 31 from Analysis of Resonant Orbits.
Technical rept.,
D. G. King-Hele, and Doreen M. C. Walker. 27 Aug 81, 27p RAE-TR-81109, DRIC-BR-81087

The Earth's gravitational potential is usually expressed as an infinite series of tesseral harmonics, and it is possible to evaluate 'lumped harmonics' of a particular order m by analyses of resonant satellite orbits - orbits with tracks over the Earth that repeat after m revolutions. In this paper we review results on 30th-order harmonics from analyses of 15th-order resonance, and results on 29th- and 31st-order harmonics from 29:2 and 31:2 resonance. The values available for 30th-order lumped harmonics of even degree are numerous enough to allow a solution for individual coefficients of degree up to 40. The best-determined coefficients are those of degree 30. For the 29th- and 31st-order harmonics, and for the 30th-order harmonics of odd degree, there are not enough values to determine individual coefficients, but the lumped values from particular satellites can be used for 'resonance testing' of gravity field models, particularly the Goddard Earth Model 10B (up to degree 36) and 10C (for degree greater than 36). The results of applying these tests are mixed.

N82-14616/0 PC A03/MF A01
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Grid Systems for Earth Radiation Budget Experiment Applications.
D. R. Brooks. Dec 81, 42p NASA-TM-83233, L-14843

Spatial coordinate transformations are developed for several global grid systems of interest to the Earth Radiation Budget Experiment. The grid boxes are defined in terms of a regional identifier and longitude-latitude indexes. The transformations associate longitude with a particular grid box. The reverse transformations identify the center location of a given grid box. Transformations are given to relate the rotating (Earth-based) grid systems to solar position expressed in an inertial (non-rotating) coordinate system. The FORTRAN implementations of the transformations are given, along with sample input and output.

PB82-153800 Not available NTIS
National Bureau of Standards, Washington, DC.
Statistics of Narrow Structures of the Gravity Field of the Earth. I. General Theory,
B. Bertotti. 10 Nov 81, 8p
Pub. in Jnl. of Geophysics Research 86, nB11 p10835-10842 1981.

With the increase in resolution and accuracy of gravity measurements it is becoming possible and increasingly important to concentrate attention on local analysis and on the role of elongated geophysical features. This paper deals with the statistical analysis of such features and develops for this purpose a new mathematical tool, the three- and four-point correlation function.

8G. Geology and Mineralogy

AD-A108 865/7 PC A03/MF A01
Colorado Univ. at Boulder.
A Measurement of Long Term Tilt in Colorado and Wyoming.
Final rept. 6 Dec 77-31 May 81,

J. Christopher Harrison, and Judah Levine. 1 Sep 81, 49p AFGL-TR-81-0304
Contract F19628-78-C-0065

We have developed a borehole tiltmeter capable of operating for long periods of time at tidal sensitivity, and we have developed six of these tiltmeters at two sites near Boulder, Colorado. The data from the tiltmeters are recorded using a data acquisition and control system capable of recording the data from a large number of widely spaced instruments linked to a central site by means of telephone lines or radio links. We have also written analysis software to examine the power spectra of the tilt records, to extract the tidal admittance from time series and to evaluate the coherence between different instruments as a function of frequency. We have used our tilt array to measure the amplitude and phases of the major components of the earth tides, and we have examined the time dependence of the tidal admittance. We also have some preliminary estimates of the coherence between independent instruments at periods longer than one day. (Author)

AD-A109 369/9 PC **A02**/MF **A01**
Chicago Univ., IL. Dept. of Geophysical Sciences.
An Explicit Method of Solution of the Geomagnetic Induction Problem.
Technical rept.,
Victor Barcilon. Nov 81, 22p
Contract N00014-76-C-0034

The problem of inferring the Earth conductivity as a function of depth from surface measurements of the magnetic field is considered. Two versions of a method analogous to that of Bailey (1970) are presented. The main feature of the method consists in the fact that the conductivity is given explicitly in terms to two auxiliary sequences of functions which are found by integrating a set of first order nonlinear differential equations. (Author)

AD-A109 404/4 Not available NTIS
Stanford Univ., CA.
Poroelasticity Equations Derived from Microstructure,
Robert Burridge, and Joseph B. Keller. 18 Mar 81, 8p ARO-17902.1-M
Contract DAAG29-81-K-0032
Availability: Pub. in Jnl. of the Acoustical Society of America, v70 n4 p1140-1146 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14690/3 PC **A01**/MF **A01**
California Univ., San Diego, La Jolla. Inst. of Geophysics and Planetary Physics.
The Seismotectonics of Plate Boundaries.
Final Report, 1 Nov. 1973 - 30 Jun. 1981.
J. Berger, J. N. Brune, J. Goodkind, F. Wyatt, and D. C. Agnew. 30 Jun 81, 85p NASA-CR-165050
Contract NGR-05-009-246

Research on the seismotectonics of plate boundaries is summarized. Instrumental development and an observational program designed to study various aspects of the seismotectonics of southern California and the northern Gulf of California are described. A unique superconducting gravimeter was further developed and supported under this program for deployment and operation at several sites. Work on Earth tides is also discussed.

PB82-152075 Not available NTIS
National Bureau of Standards, Washington, DC.
Isotope Composition of Cd, Ca and Mg in the Brownfield Chondrite,
K. J. R. Rosman, I. L. Barnes, L. J. Moore, and J. W. Gramlich. 1980, 9p
Pub. in Geochemical Jnl. 14, p269-277 1980.

The isotopic composition of cadmium, calcium and magnesium in the Brownfield chondrite have been measured. The measurements on cadmium show that this element is isotopically fractionated ith the heavier isotopes relatively enriched to the extent of 2.7% per mass unit. This confirms earlier reports by Rosman and DeLaeter (1976, 1978). Calcium and magnesium show no evidence of isotope fractionation, indicating that the process responsible for fractionating cadmium does not seem to have affected these more refractory elements.

8H. Hydrology and Limnology

AD-A108 896/2 PC **A07**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
A Study of Cutoff Bendways on the Tombigbee River.
Final rept.,
C. H. Pennington, J. A. Baker, F. G. Howell, and C. L. Bond. Nov 81, 146p Rept no. WES/TR/E-81-14
Report on Environmental & Water Quality Operational Studies.

Biological and physical data were collected from four bendways within the river portion of the Tennessee-Tombigbee Waterway (TTW) from Columbus, Mississippi, to Demopolis, Alabama: Rattlesnake Bend, Cooks Bend, Big Creek Bendway, and Hairston Bend. During this study, the four bendways had not all been cut off and had been impounded for varying lengths of time. At the completion of the TTW project, all four of the bendways will be severed from the main navigation channel. Four distinct areas within each bendway were compared: above the bendway; within the bendway; below the bendway; and within the cut. Sampling was conducted from January 1979 to September 1980 to coincide with four different river stage/water temperature regimes: late fall-moderate flow/decreasing water temperature; winter-high flow/low temperature; spring-high flow/rising temperatures; and summer-low flow/warm water temperatures with increased probability of thermal stratification. Data were collected for numerous physical and water quality parameters, phytoplankton and chlorophyll, benthic macroinvertebrates, and fishes. During early September 1980 a mollusk and aquatic macrophyte survey was conducted at all four bendways. Sediment analysis and bottom profiles indicated that the substrate composition of some of the bendways is changing. Overall, the substrate of the study area is changing from a sand-gravel-fines mixture to one of predominantly sand and fines. Areas of some bendways, in particular the upper areas, were accumulating sediments. At big Creek Bendway, this accumulation completely blocked water exchange between the river and the within-bendway areas.

AD-A109 029/9 PC **A14**/MF **A01**
Owen (H. James), Palo Alto, CA.
Implementation Aspects of Flood Warning and Preparedness Planning Alternatives.
Research rept.,
H. James Owen, and M. Wendell. Aug 81, 305p
IWR-RR-81-R07
Contract DACW72-78-C-0011

The objectives of the investigation were to shed light on the policy and procedural considerations related to planning, implementation and operation of flood warning and preparedness alternatives and to suggest implementation approaches. A review of the legal liability issues involved in implementing and operating flood warning systems is included. (Author)

PB82-148206 PC **A99**/MF **A01**
Geological Survey, Albuquerque, NM. Water Resources Div.
Water Resources Data for New Mexico, Water Year 1980.
Water-data rept. (Annual) 1 Oct 79-30 Sep 80.
Sep 81, 692p USGS/WRD/HD-81/086, USGS-WRD-NM-80-1
See also report for 1979, PB82-102104. Prepared in cooperation with the State of New Mexico.

Water resources data for the 1980 water year for New Mexico consist of records of discharge and water quality of streams; stage, contents and water quality of lakes and reservoirs; and water levels and water quality in wells and springs. This report contains discharge records for 226 gaging stations; stage and contents for 24 lakes and reservoirs; water quality for 91 gaging stations, 97 observation wells. Also included are 138 crest-stage partial-record stations. Additional water data were collected at various sites, not involved in the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in New Mexico.

PB82-148677 PC **A07**/MF **A01**
National Oceanic and Atmospheric Administration, Seattle, WA. Pacific Marine Environmental Lab.
Hydrocarbons Associated with Suspended Matter in the Green River, Washington.
Technical memo.,
S. E. Hamilton, and J. D. Cline. May 81, 129p NOAA-TM-ERL-PMEL-30, NOAA-81102102

In 1978 a systematic study of suspended hydrocarbons in the Green-Duwamish River was undertaken. The goal of the study was to define the suspended hydrocarbon composition both seasonally and spatially. Emphasis was placed in hydrocarbon budgets of the river and the significance of the Renton Secondary Treatment Plant. Concentrations of total aliphatics, total 'aromatics' (which were contaminated with fatty-acid esters), and the unresolved complex mixture increase down river. Compositional changes in suspended hydrocarbons within the upper river are attributed to highway runoff. Stations encompassing the sewage outfall show influence of wastewater discharge.

PB82-152125 PC **A08**/MF **A01**
Berger (Philip R) and Associates, Inc., Bradfordwoods, PA.
Survey of Blasting Effects on Ground Water Supplies in Appalachia: Volume I.
Open file rept. 29 Sep 78-29 Sep 80,
Donelson A. Robertson, James A. Gould, Jeffery A. Straw, and Michael A. Dayton. Nov 80, 162p
BUMINES-OFR-8(1)-82
Contract J0285029
See also Volume 2, PB82-152133.

This report presents the results of a survey on blasting effects on ground water supplies in Appalachia. Literature was searched and cases of alleged water well damage were investigated. Occurrence of ground water in Appalachia is primarily in low yield, fractured, water table aquifers. Four test sites were chosen based on geographic and geologic diversity and wells were drilled at each site. Base line data on water quality, static water level, and drawdown characteristics were obtained before surface mining commenced. Blast-induced ground vibrations were measured at the surface at levels up to 5.44 inches per second maximum resultant particle velocity. Measurements made at the bottom of the wells indicated that vibrations were considerably attenuated at depths of 140 to 160 feet. No direct evidence of change in water quality or well performance was produced by blast vibrations, but removal of downslope support by excavation does cause lateral stress relief which permits the water-bearing fractures to become more open. This additional storage capacity causes the static water level to drop and for wellbore permeability to improve. Static water level recovers if sufficient recharge is available and well performance is improved.

PB82-152133 PC **A12**/MF **A01**
Berger (Philip R) and Associates, Inc., Bradfordwoods, PA.
Survey of Blasting Effects on Ground Water Supplies in Appalachia: Volume II.
Final rept. 29 Sep 78-29 Sep 80,
Donelson A. Robertson, James A. Gould, Jeffery A. Straw, and Michael A. Dayton. Nov 80, 266p
BUMINES-OFR-8(2)-82
Contract J0285029
See also Volume 1, PB82-152125.

This two-volume report presents the results of a survey on blasting effects on ground water supplies due to surface mining in Appalachia. This report contains the drawdown test data, observation wells test data, and water quality data measured at different well sites.

PB82-153024 PC **A99**/MF **A01**
Geological Survey, Cheyenne, WY. Water Resources Div.
Water Resources Data for Wyoming, Water Year 1980. Volume 1. Missouri River Basin.
Water-data rept. (Annual) 1 Oct 79-30 Sep 80.
1980, 632p USGS/WRD/HD-81/007
See also Volume 2 for Water Year 1978, PB80-177587.

Water resources data for the 1980 water year for Wyoming consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of wells. This report contains discharge records for 161 gaging stations; stage only records for 1 lake; stage and contents for 11 lakes and reservoirs; water quality for 93 gaging stations, 44 ungaged sta-

tions, 100 wells and springs; and water levels for 36 observation wells.

PB82-153610 PC **A06**/MF **A01**
Geological Survey, Albuquerque, NM. Water Resources Div.
Results of Hydrologic Tests and Water-Chemistry Analyses, Well H-4A, H-4B, and H-4C at the Proposed Waste Isolation Pilot Plant Site, Southeastern New Mexico.
Water-resources investigations (Final),
Jerry W. Mercer, Paul Davis, Kevin F. Dennehy, and Carole L. Goetz. May 81, 102p USGS/WRD/WRI/82-001, USGS/WRI-81-36
Prepared in cooperation with Department of Energy, Washington, DC.

Data were collected during hydrologic testing at wells H-4A, H-4B, and H-4C in the southern part of the proposed Waste Isolation Pilot Plant site in southeastern New Mexico. The three water-bearing zones tested, the Magenta and Culebra Dolomite Members of the Rustler Formation and the Rustler-Salado Formation contact, yield water to wells at rates less than 0.9 gallon per minute. Throughout the testing, water-pressure response in the tested zone was monitored by a pressure-transducer system. Calculated transmissivities for the Magenta Dolomite, Culebra Dolomite, and the Rustler-Salado contact at wells H-4A, H-4B, and H-4C were 0.06, 0.9, and 0.0006 foot squared per day, respectively. Water samples from the Magenta and Culebra had dissolved-solids concentrations of 22,300 and 18,100 milligrams per liter, respectivey. The major chemical constituents of ground-water samples from these two zones were sodium, chloride, and sulfate.

PB82-154329 PC **A13**/MF **A01**
Geological Survey, Charleston, WV. Water Resources Div.
Water Resources Data for West Virginia, Water Year 1979, Appendix-Coal Areas.
Rept. for Feb 76-Jan 80.
Nov 80, 295p USGS/WRD/HD-80/014, USGS-WDR-79-A
See also PB81-103343.

Water resources data for the 1979 water year for coal regions of West Virginia consist of records of discharge and water quality of streams, wells, mines, and abandoned mine shafts; and water levels in wells and abandoned mine shafts. Section 1 consists of data obtained for the statewide Coal Hydrology Monitoring project and includes discharge and water-quality data collected during two sampling periods at 361 sites.

PB82-154337 PC **A09**/MF **A01**
Geological Survey, Cheyenne, WY. Water Resources Div.
Water Resources Data for Wyoming, Water Year 1980. Volume 2. Green River Basin, Bear River Basin, and Snake River Basin.
Annual rept. 1 Oct 79-30 Sep 80.
Oct 81, 179p USGS/WRD/HD-81/002, USGS-WDR-WY-80-2
See also Volume 1, PB81-103129.

Water resources data for the 1980 water year for Wyoming consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of wells. This report contains discharge records for 62 gaging stations; stage and contents for 3 lakes and reservoirs; water quality for 38 gaging stations and 20 ungaged stations; and water levels for 7 observation wells. Also included are 24 crest-stage partial-record stations.

PB82-154998 PC **A02**/MF **A01**
Washington Univ., Seatile. Dept. of Civil Engineering.
Lake Restoration by Dilution: Moses Lake, Washington.
Journal article,
E. B. Welch, and C. R. Patmont. Feb 80, 12p EPA-600/J-80-369
Grant EPA-R-805430
Pub. in Water Research, v14 p1317-1325 1980.

Dilution water, low in macronutrients, was added to Moses Lake on three occasions in 1977 and once in 1978 during the spring-summer period. The addition resulted in reducing the annual average inflow concentration of phosphorus from about 130-140 micrograms/l to 100 micrograms/l. The water exchange rate in Parker Horn, which is 8% of the lake volume, increased about 1%/day normally to 7 and 11%/day for the May-September period in 1977 and 1978, respectively. Improvements in lake water quality, compared to values from 1969-70, were rather good with greater reductions in algal biomass.

PB82-158379 PC **A05**/MF **A01**
Tennessee Valley Authority, Norris. Water Systems Development Branch.
Ground Water Quality Monitoring in the Tennessee Valley Region.
Technical rept.,
Wiley F. Harris. Oct 81, 98p TVA/ONR/WR-82/5, WR28-1-250-110

This report brings together information for those persons engaged in or planning ground-water monitoring systems at waste disposal and research sites in the TVA region. It describes geohydrology considerations for monitoring systems, monitoring system design, monitoring methods, monitor well construction, water quality data collection and system evaluation. These considerations can provide guidance in establishing effective monitoring systems which can detect contamination if it occurs and provide information for assessing the impacts on usable aquifers.

8I. Mining Engineering

PB82-138264 PC **A06**/MF **A01**
Colorado School of Mines Research Inst., Golden.
Evaluation of Environmental Factors Involved in Metallurgical Processes to Utilize Domestic Resources for Production of Alumina. Phase II Report: Assessment of Two Raw Material/Process Technology Options.
Open file rept. Nov 78-Dec 79,
L. C. Tisdel, W. J. Roshey, A. G. Melcher, F. T. Davis, and J. M. Link. Dec 79, 122p J70810-2, BUMINES-OFR-165(1)-81
Contract J0275040
See also PB-299 937, PB-299 969, and PB82-138272.

This study provides information on the environmental factors of two options for production of alumina from kaolin clay raw material that were selected by the Bureau of Mines for further study from six raw material-process technology options considered in a previously issued report. The options under study are hydrochloric acid leaching using HCl gas-induced crystallization and nitric acid leaching. This study concentrates on the hydrochloric acid leaching option because it has been identified as having a better potential for commercial development. Included in the assessment are mining and transportation of ore, construction and operation of the process plant, disposal of process wastes, and land reclamation considerations. The primary information sources for the study included process feasibility studies, Reports of Investigations, Information Circulars, and nonpublished material provided by the Bureau of Mines. The results indicate that the hydrochloric acid leaching option exhibits the least potential for adverse environmental effects.

PB82-138272 PC **A03**/MF **A01**
Colorado School of Mines Research Inst., Golden.
Evaluation of Environmental Factors Involved in Metallurgical Processes to Utilize Domestic Resources for Production of Alumina. Phase III Report: Environmental Impact Criteria for Evaluating Potential Pilot Plant Sites: Clay/Hydrochloric Acid Extraction-Gas Induced Crystallization Process.
Open file rept. Jul 80-Mar 81,
L. C. Tisdel, A. G. Melcher, and G. M. Hermsen. Mar 81, 50p J70810-3, BUMINES-OFR-165(2)-81
Contract J0275040
See also PB-299 969, and PB82-138264.

This study provides information on criteria for use in environmental evaluation of potential sites for a pilot plant where production of alumina from domestic clay resources would be investigated. The study was based on a preliminary design for a pilot plant utilizing a hydrochloric acid extraction-gas induced crystallization process. The pilot plant would cover approximately 30 acres and construction would take approximately 2 years with a work force of 200 to 225 employees. An operating period of approximately 3 years is projected employing 160 to 170 people. The expected scale of the pilot plant is such that significant impact on most environmental factors of current concern could occur. Thus, selection of a suitable site would be an important part of the planning process for the project. The results indicate that, among the environmental evaluation criteria developed, those related to preventing or minimizing adverse empact on socioeconomic conditions and air and water quality are likely to be most pertinent in the selection of a suitable pilot plant site.

PB82-142217 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
An Assessment of Three Different Fire Resistance Tests for Hydraulic Fluids.
Final rept.,
Joseph J. Loftus. Oct 81, 54p NBSIR-81-2395
Sponsored in part by Bureau of Mines, Pittsburgh, PA, and Mine Safety and Health Administration, Triadelphia WV.

The Center for Fire Research (CFR) at the National Bureau of Standards (NBS) at the request of the Mine Safety and Health Administration (MSHA) and the Bureau of Mines (BOM) made an evaluation or assessment of the three different flammability tests used by MSHA for measuring the fire resistance of hydraulic fluids intended for use in underground coal mining operations. The methods described in the Code of Federal Regulations Schedule 30, Part 35, consist of the following: an Autogenous Ignition Temperature Test, a Temperature-Pressure Spray Ignition Test, and a Test to Determine the Effect of Evaporation on the Flammability of Hydraulic Fluids. This report summarizes the various studies conducted in the evaluation and provides recommendations for improvement of the three test procedures.

PB82-143165 PC **A04**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Production Engineering, Development, and Demonstration of the Draft Power Sensor: Volume I.
Open file rept. Apr 79-30 Nov 80,
H. Stanley Benson. Nov 80, 60p BUMINES-OFR-152-81
Contract H0292016

This report describes research conducted to improve the performance of and then further field test draft power sensor (DPS) equipment. DPS equipment enables a bulldozer operator to optimize a machine's work rate. Significant improvements were made in DPS hardware, and extended field testing was conducted at two working strip mines. The report documents the increase of bulldozer work production by greater than 20 percent while using the DPS compared with baseline work production without benefit of the DPS.

PB82-146267 PC **A04**/MF **A01**
Hamilton Engineering, Inc., Seattle, WA.
High Speed Drill Probe to Detect Abandoned Underground Workings.
Open file rept. (Final) Dec 79-Jun 81,
Robert W. Gordon, and Glen O. Baker. Jun 81, 58p BUMINES-OFR-5-82
Contract H0292026

This report describes the results and conclusions of the further development of a previously developed lightweight probe drill for use in anthracite mines. The improvements included (1) better hole cleaning due to the development of an air-water mist flushing system, (2) the application of roof drill bits to allow drilling through rock seams and lenses, (3) the development of a quick coupling drill system that reduced total steel change time, and (4) adaptation of a swivel to the drill anchoring system that greatly reduced set-up time between holes. With these improvements, the probe drill drilled the required 11 holes in one shift and gained miner acceptance as a viable underground working tool. The probe drill proved to meet all design requirements of portability, low-weight: drilling controllability, structural integrity, and reliability. In addition to drilling the required probe pattern, the probe drill is capable of drilling long holes. By drilling several holes over 80 feet deep the probe drill has the potential for use in robbing pillars and for methane drainage.

PB82-146325 PC **A07**/MF **A01**
Brown (Dayton T.), Inc., Bohemia, NY. Engineering and Test Div.

Environmental Test Criteria for the Acceptability of Mine Instrumentation.
Open file rept. 18 Jan 80-18 Jun 81,
Kenneth Trelewicz. Jun 81, 138p BUMINES-OFR-1-82
Contract J0100040

This report describes the two-phase effort that went into developing environmental test criteria for general mine instrumentation. Phase I consisted of research and mine visits to develop an environmental profile for mine instrumentation. The profile was translated into general requirements and into test requirements. A review of existing government and commercial specifications was performed to determine if they matched mine instrumentation test requirements. Finally, a set of environmental test procedures was developed to test mine instrumentation. Phase II consisted of selecting and purchasing sample mine instrumentation and subjecting them to the previously developed tests. The purpose was to evaluate the criteria developed for use as an instrumentation test document and to determine the effects of the various criteria on a representative sample of both proven and newly developed instrumentation. The test criteria were then modified, based on test results, and are included in the report.

PB82-149352 PC **A09**/MF **A01**
Ko (Kenneth C.) and Associates, Inc., Denver, CO.
Flexible Liner for Use in Advancing Tailgate.
Open file rept. May 79-Sep 80,
Kenneth C. Ko. Nov 80, 192p BUMINES-OFR-6-82
Contract H0292014

This report describes an investigation on the technical and economic feasibility of implementing flexible liner-backpacking support systems in an advancing tailgate longwall mine. The system consists of a circular tube constructed of liner plates and flyash backpacking. Flyash is pneumatically stowed into the tailgate. Small amounts of cement may be mixed to improve the support capability of the fill in difficult local ground conditions. Water is added inside the nozzle immediately prior to spraying. Results of theoretical analyses and a field test show that the designed system is technically feasible, can be cost-competitive, provides more stable ground conditions, and can increase productivity and coal recovery, compared with existing retreat longwall systems. In certain mine layouts, the system can reduce the direct mining costs by a significant amount and would be particularly applicable to deeper coal beds with bad ground conditions.

PB82-803974 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mine Safety: Fires and Explosions. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 270p
Supersedes PB80-815368, and NTIS/PS-79/1001.

The citations cover research on underground mine fires and explosions, as well as safety and preventive measures. The primary concern is with methane and coal dust explosions. Safety barriers, dust control, combustion products, fire sensors, fire suppression, metal spark inhibition, and dust explosions are included. (This updated bibliography contains 263 citations, 40 of which are new entries to the previous edition.)

PB82-804055 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mine Safety: Communication and Position Finding Systems. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 110p
Supersedes PB80-815376, and NTIS/PS-79/1002.

Research reports are cited which cover underground mine communications and trapped miner location. The topics include operational and emergency communication systems, detection and position finding by electromagnetic and seismic means, and electromagnetic noise in mines. (This updated bibliography contains 102 citations, 9 of which are new entries to the previous edition.)

PB82-861931 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cementing of Oil and Gas Wells. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 140p

This bibliography cites reports concerned with the research and development of cementing compositions and processes for utilization by the oil and gas well drilling industry. Ultra-low density cementing compositions, prevention of annular gas flow following cementing operations, ultrasonic nondestructive testing of oil well cementations at high temperatures and pressures, evaluation of cement slurry rheology, cementing techniques and materials for petroleum and gas storage wells, and utilization of cementing spacers and washes are among the topics discussed. Innovations in cementing machinery and equipment as well as case studies are included. (Contains 157 citations fully indexed and includes a title list.)

PB82-862566 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mine Hoists and Hauling. 1973-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1973-Feb 82.
Feb 82, 216p
Supersedes PB80-809205.

Mine hoists and hauling equipment, and practices, are covered in the cited reports. Equipment design, construction and use, and safety and emergency escape are included. Mine conveyer systems for people, equipment, coal, rock, and other materials are described. Mine practices and procedures, as they relate to hauling, lifting and conveying, are mentioned. (This updated bibliography contains 246 citations, 46 of which are new entries to the previous edition.)

PB82-862574 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mine Hoists and Hauling. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 289p
Supersedes PB80-809197.

Mine hoists and hauling equipment, and practices, are covered in the cited reports. Equipment design, construction and use, and safety and emergency escape are included. Mine conveyer systems for people, equipment, coal, rock, and other materials are described. Mine practices and procedures, as they relate to hauling, lifting and conveying, are mentioned. (This updated bibliography contains 238 citations, 61 of which are new entries to the previous edition.)

8J. Physical Oceanography

AD-A108 757/6 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Products from Two Computer Programs which Process Digital Bathymetric Data.
Coastal engineering technical aid,
Barry E. Herchenroder. Oct 81, 17p Rept no. CERC-CETA-81-13

A description is given of products from two computer programs which process digital bathymetric data. One program generates regularly spaced bathymetric data from irregularly spaced data. The other uses regularly spaced data to determine and draw contours. A large set of irregularly spaced bathymetric data available on magnetic tape for U.S. coastal regions is also described. Examples of output from each program are displayed for two coastal areas. (Author)

AD-A108 779/0 PC **A03**/MF **A01**
Office of Naval Research, London (England).
A Partial Review of Marine Science in Western Europe.
Technical rept. 1 Jan 79-30 May 80,
Wayne V. Burt. 1 Oct 80, 26p Rept no. ONRL-R-5-80

This review contains short summaries of marine research and comments on these activities. Each country summary is followed by a series of discussions of individual centers of marine research. The discussions include the research programs, sources of funding, key personnel, trends, and comments. The review is essentially complete for Spain, Portugal, and The Netherlands, and partially complete for the U.K. and France. (Author)

AD-A109 050/5 PC **A03**/MF **A01**
Electronics Research Lab., Adelaide (Australia).
An Aerial Survey of Water Turbidity and Laser Depth Sounding Performance Along the Queensland Coast.
Technical rept.,
D. M. Phillips, and R. H. Abbot. Apr 81, 29p Rept no. ERL-0192-TR

The performance of the WRELADS laser airborne depth sounder has been assessed in North Queensland coastal waters from Townsville to Torres Strait. This was achieved by recording water turbidity and maximum sounding depth in the aircraft along the flight path. The parameter used in the aerial survey as a measure of water turbidity was related to beam attenuation coefficient measured from a boat in a joint aircraft and boat trial. Data relating the statistical distribution of turbidity to water depth were obtained and compared with the observed performance characteristic in order to indicate the proportion of Queensland coastal waters suitable for sounding with an airborne laser sounder. (Author)

AD-A109 133/9 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Analysis of Fleet Reports of Bioluminescence in the Indian Ocean.
Interim rept. Jun 80-Jun 81,
R. V. Lynch, III . 14 Dec 81, 9p Rept no. NRL-8526

From June 1980 to June 1981, units of the Seventh Fleet stationed in the Indian Ocean have sent reports of bioluminescence and ancillary data to the Naval Research Laboratory to aid its study of the geographical and seasonal distribution of bioluminescence in the oceans. The results of the analysis of these reports is presented in this publication. The appearance of characteristic bioluminescent phenomena, including displays, is described. (Author)

N82-14790/1 PC **A12**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Light Fields in the Ocean.
V. N. Pelevin, and M. V. Kozlyaninov. Nov 81, 267p
NASA-TM-76731
Contract NASW-3542
Transl. Into English from the Book "Svetovyye Polya V Okeane" Moscow, 1979 p 1-232, 243-258. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Academy of Sciences (USSR).

The problem of light fields in the ocean is in basic ocean optics. Twenty-six separate studies discuss: (1) the field of solar radiation in the ocean; (2) stationary and nonstationary light fields created in the sea by artificial sources; and (3) the use of optical methods to study biological and hydrodynamic characteristics of the sea.

PB82-149246 PC **A04**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Meteorology.
Meteorological and Aircraft Data for CUE II 1973,
David W. Stuart, and Jeffrey D. Hawkins. Jul 81, 57p
CUEA-74, FSU-MET-STU-81/5, NSF-IDOE-81-88

Documentation of the various meteorological observations made in support of the CUE II experiment in coastal upwelling off Oregon during the summer 1975 is presented. Details of the instruments, observational techniques, and data recording systems, digitizing and reduction techniques are discussed. Selected parameters from land stations are presented as time plots. All sea surface temperature maps prepared via the aircraft are included.

PB82-154121 PC **A15**/MF **A01**
National Oceanic and Atmospheric Administration, Seattle, WA. Pacific Marine Environmental Lab.
Low Molecular Weight Hydrocarbon Concentrations (C1-C4), Alaskan Continental Shelf, 1975-1979.
Data rept.,
Charles N. Katz, and Joel D. Cline. Dec 80, 335p
NOAA-DR-ERL-PMEL-2, NOAA-81050608

Dissolved low molecular weight (LMW) aliphatic hydrocarbons, C1 - C4, were measured on the Alaskan Continental shelf as a part of the Outer Continental Shelf Environment Assessment Program (OCSEAP). This data report summarizes light hydrocarbon concentrations made during 13 cruises from 1975 to 1979. Spatial and temporal hydrocarbon distributions were ob-

tained in seven geographical areas of the Alaskan shelf. These areas include the northeast Gulf of Alaska, Cook Inlet, Kodiak Shelf, Shelikof Strait, southeast Bering Sea, Norton Sound, and Chukchi Sea. Vertical profiles at each station usually included samples taken at the surface and within 5 m of the bottom.

PB82-803982 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mine Safety: Occupational Health--Radioactivity. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 172p
Supersedes PB80-815400, and NTIS/PS-79/1004.

Data are presented on radiation hazards in the mining environment. Topics discussed are radiation monitoring, control and protection, mine ventilation, and occupational diseases with special references to lung cancer. Emphasis is given to uranium mining and occupational hazards from radon and decay products. (This updated bibliography contains 165 citations, 37 of which are new entries to the previous edition.)

8K. Seismology

AD-A108 770/9 PC **A04**/MF **A01**
Sierra Geophysics, Inc., Arcadia, CA.
Seismic Studies of Regional Path Properties of Eurasia. Part I.
Annual technical rept. 1 Oct 80-30 Nov 81,
Ilene R. Samowitz, and David M. Hadley. 15 Nov 81, 57p Rept no. SGI-R-81-044
Contract N00014-81-C-0148, ARPA Order-4152

The goal of this study has been to improve the basis for predicting regional path properties encountered by surface waves propagating in Eurasia. At regional distances the observed seismograms are severely influenced by seismic structure along the path between the source and the receiver. Accurate earth models therefore play a critical role in the ability both to detect small events and to discriminate between earthquakes and explosions. Once the regional earth properties and the mode of seismic wave propagation are well understood, seismic source characterization will be much more reliable. The successful completion of modeling regional seismic surface waves requires several steps: (1) construct starting models for each geologic province that are based on a review and synthesis of the geologic and seismic literature; (2) review and collect seismic data for paths crossing each geologic province; (3) reduce the seismic data to group and phase velocity dispersion curves; (4) invert the dispersion data to improve the regional models. This report summarizes work completed during the first year of a two-year effort. Although several path averaged models that match the observations have been derived during this contract year, the primary emphasis has been in the first three tasks listed above.

AD-A109 016/6 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Seismological Lab.
Multimode Analysis of Rayleigh-Type Lg. Part 1. Theory and Applicability of the Method,
Michel Cara, and J. Bernard Minster. 27 Jun 80, 14p AFOSR-TR-81-0821
Contracts F49620-81-C-0008, F49620-77-C-0022
Pub. in Bulletin of the Seismological Society of America, v71 n4 p973-984 Aug 81. Sponsored in part by Contracts USGS-14-08-0001-18331 and USGS-14-08-0001-19720.

No abstract available.

AD-A109 184/2 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Seismic Discrimination.
Semiannual technical summary rept. no. 34, 1 Oct 80-31 Mar 81,
Michael A. Chinnery. 31 Mar 81, 105p ESD-TR-81-84
Contract F19628-80-C-0002, ARPA Order-512

This Semiannual Technical Summary describes the Lincoln Laboratory Vela Uniform program. Section I describes progress in the development of a prototype Seismic Data Center. This development is on schedule, and a first version of the prototype will be operational during the next six months. Section II describes a series of activities in the development and implementation of the seismic processing techniques that will be utilized in the prototype system. Section III describes a series of investigations in General Seismological Research.

PB82-804097 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Earthquake Prediction. 1970-1981 (Citations from the Engineering Index Data Base).
Jan 82, 91p
Supersedes PB80-815061, and NTIS/PS-79/0966.

Techniques for forecasting the probability of earthquake occurrence are analyzed in these reports reviewed in a worldwide literature survey. Seismology, tectonics, and geophysics are among the sciences used for earthquake prediction. (This updated bibliography contains 84 citations, 16 of which are new entries to the previous edition.)

PB82-861485 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Earth Core and Lower Mantle: Seismic Investigations. 1977-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1977-Feb 82.
Feb 82, 166p

This bibliography covers principles, observations, analyses, and interpretations of the properties and behavior of the earth's core and lower mantle which are derived from investigation of various seismic parameters and phenomena. Also considered are seismic wave propagation characteristics in these media. (Contains 135 citations fully indexed and including a title list.)

8L. Snow, Ice, and Permafrost

AD-A109 002/6 PC **A05**/MF **A01**
Washington Univ., Seattle. Polar Science Center.
Sea Ice Movements from Synthetic Aperture Radar.
Final rept. 1 Apr 79-30 Jun 81,
David A. Rothrock, and Alan S. Thorndike. 1 Dec 81, 84p
Contract N00014-79-C-0418

The spatial structure of the sea ice velocity field determines ridging, open water production and ice stress. The velocity has been measured roughly every 2 km along an 865 km track from SEASAT synthetic aperture radar. The movement shows individual pieces as large as 100 km. The spatial autocorrelation function of velocity has been estimated from these data and FGGE and AIDJEX buoy data, and has a length scale of roughly 1000 km. A model of the movement of a set of pieces shows the large uncertainty in opening and ridging estimated from velocities measured at only three points. (Author)

8M. Soil Mechanics

AD-A109 000/0 PC **A04**/MF **A01**
San Diego State Univ., CA. Dept. of Civil Engineering.
Laboratory Verification of Blast-Induced Liquefaction Mechanism.
Final rept. Jan-Jul 81,
Richard J. Fragaszy, and Michael E. Voss. Oct 81, 59p AFOSR-TR-81-0843
Grant AFOSR-81-0085

A mechanism for blast-induced liquefaction was tested in a series of high pressure undrained, isotropic compression tests on saturated samples of Eniwetok beach sand and Ottawa sand. Theory, based on inelastic volume compressibility of sand, was shown to be valid for the case of quasi-static, isotropic loading. Specimens of Eniwetok sand subjected to an initial effective stress of 1 MPa were liquefied by a single cycle of loading of 34 MPa. Specimens of Ottawa sand, tested in the same manner, generated excess pore pressure but not enough to completely liquefy the soil. The errors introduced by flexibility of the testing systems were analyzed and found to be insignificant. Suggestions for future research were made. (Author)

PB82-147505 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Sea Grant Coll. Program.
The Piezocone Penetrometer,
Mohsen M. Baligh, Amr S. Azzouz, Anwar Z. E. Wissa, R. Torrence Martin, and Michael J. Morrison.
Jul 81, 26p MITSG-81-10, NOAA-81102113
Grant NA79AA-D-11010
Index No. 81-310-Cim.

A piezocone penetrometer has been developed that is capable of simultaneously measuring cone resistance, pore water pressure, and skin friction during cone penetration. The piezocone was evaluated in a marine clay deposit with established engineering properties and where previous extensive cone penetration data are available. Results indicate that the device provides repeatable and reliable measurements and proved to be extremely useful in the determination of soil stratification and identification. In addition, pore pressure dissipation measurements when penetration stops can be used to estimate the consolidation and/or permeability characteristics of soils.

PB82-154576 PC **A03**/MF **A01**
Woodward-Clyde Consultants, Rockville, MD.
Sensing Systems for Measuring Mechanical Properties in Ground Masses. Volume 5: Dutch Cone Penetrometer Tests--Case Histories.
Final rept.,
R. A. Waltkus, C. R. Burgin, and R. E. Smith. Dec 81, 48p 77C731, FHWA/RD-81/113
Contract DOT-FHWA-7-3-0158

This report provides case history and applied research information relative to the use of the Dutch Cone penetrometer in the practice of geotechnical engineering. Five case histories are cited that demonstrate the usefulness and possible limitations of the Dutch Cone. Comparisons and correlations are made between the cone and other field and/or laboratory tests. Additionally, the results of analysis involving Dutch Cone data are compared to other analysis methods and in some cases observed behavior.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A108 766/7 PC **A11**/MF **A01**
IBM Federal Systems Div., Manassas, VA.
Electrical Characterization of Super Schottky.
Final technical rept.,
R. A. Lawrence. Jul 81, 229p RADC-TR-81-194
Contract F30602-80-C-0068

State-of-the-art bipolar logic technology has advanced with the recent introduction of 'Super Schottky' and 'Low Power Super Schottky' product lines by two semiconductor manufacturers. Texas Instruments (T.I.) and Fairchild Semiconductor have utilized advances in processing techniques such as oxide isolation and refinements in the resolution of photolithographic equipment to enhance the speed and reduce the power of present day Schottky (S) and Low Power Schottky (LS) technologies. This report provides results obtained from the electrical characterization over the military temperature range (-55 CTj to + 125 CTj) of gate and flip-flop samples of three new transistor Transistor

Logic (TTL) technologies; Advanced Schottky (AS), Advanced Low Power Schottky (ALS), and Fairchild Advanced Schottky (TTL) (FAST). This report shows that each technology offers the system designer unique advantages in terms of improved performance, power reductions, and space savings derived from functional design complexity. The performance improvements obtained by these new logic technologies, however, present implicit new application and testing considerations that could previously be ignored by the military system designer.

AD-A108 780/8 PC **A05**/MF **A01**
Syracuse Univ., NY. Dept. of Electrical and Computer Engineering.
The Response of a Two-Wire Transmission Line to Incident Field and Voltage Excitation, Including the Effects of Higher Order Modes.
Phase rept. 1 Oct 79-30 Sep 80,
Yehuda Leviatan, and Arlon T. Adams. Aug 81, 88p RADC-TR-81-214
Contract F30602-79-C-0011

The main objective of this report has been to derive the induced current on a two-wire transmission line due to incident field excitation. Special attention has been paid to the case of voltage source excitation, where the current may be given, at least approximately, using the so-called leaky-wave concept. The influence of the electrical dimensions of the structure on the currents and the relative importance of the higher modes is examined by numerical examples. (Author)

AD-A108 853/3 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
High-Performance GaInAsP/InP Avalanche Photodetectors.
Journal article,
Vicky Diadiuk, Charles E. Hurwitz, Stenen H. Groves, and Gerald W. Iseler. 1981, 6p MS-5619, ESD-TR-81-312
Contract F19628-80-C-0002
Pub. in SPIE, v272 p17-21 1981.

No abstract available.

AD-A109 175/0 PC **A02**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Y-Circulator with Dielectric Filler,
A. K. Stolyarov, I. P. Tyukov, V. N. Shakhgedanov, and A. A. Shilova. 10 Dec 81, 6p Rept no. FTD-ID(RS)T-1275-81
Edited trans. of Patent (USSR) 216 065, 11 Apr 68, p45-46, by Robert Allen Potts.

No abstract available.

AD-A109 250/1 Not available NTIS
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Asymptotic Eigenequations and Analytic Formulas for the Dispersion Characteristics of Open Wide Microstrip Lines,
Weng Cho Chew, and Jin Au Kong. 16 Dec 80, 10p ARO-17209.7-EL
Contract DAAG29-80-C-0104
Availability: Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-29 n9 p933-941 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14307/4 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Deposition of Thin Insulation Layers from the Gas Phase.
R. Behn, H. Hagedorn, J. Kammermaier, M. Kobale, and H. Packonik. Jul 81, 86p NASA-TM-76607
Contract NASW-3198
Transl. Into English from (Germany, F.R.). Bmft-FB-T-76-66 Unternehmensber. Bauelemente Hauptber. Grundlagnentwicklung, and Bundesmin. Fuer Forsch. Und Technol. Munich, May 1976 p 1-88. Original Language Document Was Announced as N77-29418. Transl. By Scitran, Santa Barbara, Calif.

The continuous deposition of thin organic dielectric films on metallized carrier foils by glow discharge in monomeric gases is described. Depending on the applied monomers, the films had a dissipation factor of .001 to .003 (1 kHz), a relative permittivity of 2.3 to 2.5 and a resistivity of about 10 to the 17th power omega cm. Additionally, they proved to have a high mechanical homogeneity. Self-healing rolled capacitors with a very high capacitance per volume and of consistently high quality were fabricated from the metallized carrier foils covered with the dielectric film.

N82-14444/5 PC **A12**/MF **A01**
McDonnell Douglas Astronautics Co.-St. Louis, MO.
Reliability Study of Opto-Coupled Semiconductor Devices and Light Emitting Diodes (Led).
Final Technical Report, Oct. 1974 - Oct. 1977.
R. C. Maurer, V. A. Weissflug, and E. V. Sisul. Oct 77, 256p NASA-CR-161923
Contract NAS8-30777

Opto-coupler and light emitting diode (LED) failure mechanisms and associated activation energies were determind from the results of environmentai and accelerated lift tests of over 2,400 devices. The evaluation program included LED phototransistor opto-couplers from three sources, LED photoamplifier opto-couplers from a single source, and discrete infrared emitting LEDs from two sources. Environmental tests to evaluate device mechanical integrity included power cycling (10,000 cycles), temperature cycling (500 cycles) and a sequence of monitored shock, monitored vibration and constant acceleration. Multiple temperature operating life tests were conducted at ambient temperatures between 25 C and 200 C. Opto-couplers were operated in both the 'on' and 'off' states during life testing.

N82-14465/0 PC **A06**/MF **A01**
Allgemeine Elektricitaets-Gesellschaft AEG Telefunken, Heilbronn (Germany, F.R.).
Mos Field Effect Transistors for UHF Applications.
Final Report.
W. Quast, and W. J. Rabe. Feb 81, 111p BMFT-FB-T-81-030, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Three different techniques for the fabrication of UHF MOSFET's were developed and their suitability as a production process was examined. The source and drain regions were realized by phosphorus ion implantation followed by selective oxidation, by diffusion from P and As doped oxides (PDO), and by a double lateral diffusion process. In order to characterize the fabricated MOSFET tetrodes, S parameters at high frequencies (800 MHZ) were measured. The best results were obtained with elements which were manufactured using the PDO technique. A one-dimensional small signal MOS model was derived which is able to describe the static characteristics of short channel MOS transistors.

N82-14466/8 PC **A05**/MF **A01**
Allgemeine Elektricitaets-Gesellschaft AEG Telefunken, Ulm (Germany, F.R.).
Development of a Dual Mode Satellite Traveling Wave Tube 11GHZ, 12W/6W.
Final Report, Jul. 1978.
L. Deml. Feb 81, 94p BMFT-FB-W-81-001, ISSN-0170-1339
Partly in German and English. Sponsored by Bundesministerium fuer Forschung und Technologie.

A high power 11GHz dual mode traveling wave tube (TWT) was developed for use in communication satellites. The tube is based on the technology of previous space-qualified tubes (TL12006, TL12022, and TL12025). The tube operates at 12 or 6W, separated by 3dB, without a dramatic efficiency loss in the low power mode. Gain, efficiency and nonlinear distortion criteria are all met, by channel tuning the tube within the operating band (from 10.9 to 11.8 GHz). The channel bandwidth is 100MHz.

N82-14470/0 PC **A05**/MF **A01**
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
Modeling the Influence of Static Acceleration on Surface Wave (Quartz) Oscillators.
Ph.D. Thesis - Paris Univ.
P. Levesque. 1981, 96p ONERA-NT-1981-3, ISSN-0078-3781
In French; English Summary. Report Will Also Be Announced as Translation (Esa-TT-726).

The application of a static acceleration on a quartz oscillator, working in elastic surface wave mode, was modeled. Modification of the wave propagation speed through the substrate and its frequency are studied. The frequency shift depends on the nature of the substrate through which the wave is propagated, but also on its dimensions and its mode of attachment. The relationship between the stresses arising in the substrate during the acceleration and the sensitivity to this acceleration of surface wave devices are shown.

PAT-APPL-6-226 668 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Electro-Ceramic Stack.
Patent Application,
Frank R. Abbott. Filed 21 Jan 81, 12p AD-D009 062/1
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A transducer of acoustic energy through a water medium is fabricated in a manner which assures high reliability yet significantly reduces cost per unit by including modified conductive elements. A pair of flat conductors are interleaved sinuously through a ferroelectric stack in a mutually orthogonal relationship. The conductors are so interleaved as to electrically couple the elements of the ferroelectric stack in parallel in accordance with proven transducer design. At least one rod axially extends through the sandwiched ferroelectric elements and conductors to hold them in compression and to assure a reliable electrical connection for producing an integral hydroacoustically cooperating structure. (Author)

PB82-152711 Not available NTIS
National Bureau of Standards, Washington, DC.
Characterization of Point-Plane Corona Pulses in SF6,
R. J. Van Brunt, and D. A. Leep. Nov 81, 13p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of Applied Physics 52, n11 p6588-6600 Nov 81.

The properties of streamer or electron avalanche pulses have been investigated for point-plane, positive and negative dc corona discharges in gaseous SF6 over the pressure range of 50 to 500 kPa. Measurements were made of the voltage and pressure dependence of electrically-detected corona pulse-height-distributions, pulse shapes and repetition rates. Positive corona pulses appear at onset as low level electron avalanches which, at higher voltages, develop into large streamers usually followed by a burst of many smaller pulses. The burst characteristics of positive corona show a definite dependence on pressure and voltage which is evident in the pulse height distribution data. Negative corona displays characteristics which are sensitive to cathode surface conditions. For a point electrode that is either exposed to uv radiation or has been conditioned by prior discharges, the negative corona appears predominately in a quasi-glow mode consisting of relatively low-level pulses of high repetition rate.

PB82-162884 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Paulo (Brazil).
Balun Line: Microstrip Release,
Lucio Baptista Trannin Cividanes. May 81, 14p INPE-2072-NTE/172
Trans. of mono. Balun Faixa-Larga em Linha de Fita, Sao Jose, 16p May 81. See also Portuguese version N81-30359.

The theory and design of a tapered balun transformer which functions over a wide frequency range is presented. The balun is an impedance-match transition from a microstrip line to a balanced line, formed by two strips with equal width, one strip on each side of the dielectric sheet. Measurement on a test balun show a good performance, both in voltage standing wave ratio and in insertion loss. For its inherent ease of construction and good reproducibility, this type of balun can be utilized in a great number of applications, including the construction of balanced mixes and the excitation of antennas.

PB82-861519 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Silicon Controlled Rectifiers. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 269p

Field 9—ELECTRONICS AND ELECTRICAL ENGINEERING

Group 9A—Components

This bibliography covers design, testing, manufacturing, and applications of silicon controlled rectifiers (SCR) and related devices. Specific SCR applications are in power supplies, switches, converters, inverters, choppers, regulators, and modulators in electrical equipment. Modeling, computer analysis, commutation failure, electronic control, novel design and new technology, cooling, and protection techniques of SCR circuits are also discussed. (Contains 274 citations fully indexed and includes a title list.)

PB82-862392 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrical Insulating Materials. October, 1977-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Oct 77-Feb 82.
Feb 82, 266p
Supersedes PB80-856016.

This bibliography cites reports on the composition, methods of application, and testing procedures of various electrical insulating materials. Deterioration of extruded synthetic insulation and sheathing materials for underground and exterior high voltage applications, insulating properties of electric steel with bichromate-emulsion resin coating, and energy conservation factors of electrical machinery utilizing innovative insulation materials are among the topics discussed. Moisture effects on polymeric electrical insulating materials are also included. (This updated bibliography contains 267 citations, 67 of which are new entries to the previous edition.)

PB82-862525 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
WKB Analysis : Waveguides. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 83p

Citations in this bibliography cover principles and applications for WKB analysis to various types of waveguides. Approximations, calculations, and solutions by the WKB method are considered with respect to the design, properties, and performance of the waveguides. (Contains 69 citations fully indexed and includes a title list.)

RL-80-034 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Work in the U.K. on Filamentary A15 Conductor Development.
J. A. Lee, and C. A. Scott. Jul 80, 11p
U.S. Sales Only.

Work on Nb sub 3 Sn conductor development work began at Harwell in 1967 with work on stable filamentary Nb sub 3 Sn composites starting in 1969. This lead to a series of small magnets built at the Rutherford laboratory, using conductors incorporating high purity copper regions protected by diffusion barriers of both tantalum and phosphorus poisoned niobium, and the Wind-react technique for magnet construction was established. A magnet development programme lead to the construction of a 450mmx50mm hexapole magnet. IMI's parallel conductor programme developed tantalum diffusion barriers and used a hot extrusion first stage. The present position on conductor development is the result of a unification in 1979 of technical and commercial interests including university programmes. This current position is reported. (Atomindex citation 12:576750)

9B. Computers

AD-A108 767/5 PC **A03**/MF **A01**
Goodyear Aerospace Corp., Akron, OH.
Pipeline Processor Configuration Study.
Final technical rept. 27 May 80-27 May 81,
J. L. Potter, and J. R. Wiseman. Sep 81, 30p RADC-TR-81-238
Contract F30602-80-C-0163

The pipeline processor configuration study (ppcs) resulted in a high-performance processor system design for automatic screening and image exploitation systems. Key to the success of this design effort was combining the pipelining and parallel processing techniques to overcome typical system problems such as data throughput (I/O) and algorithm flexibility (programmability). The design combines subsystem components that are either already in existence or are currently under development into a system that contains many features not found in any other exploitation system described in the literature. For example, not only can the system process data at over 150 mbits per second, but it can also handle multiple-sensor data from different sensor types in an interleaved (time shared) manner at these rates. Thus, much lower exploitation system development and life cycle costs are possible with this one common auto screening system. Since it is 100 percent programmable, it can also accommodate new algorithms and approaches to target recognition such as multiple (group) target analysis. The results of an image exploitation algorithm analysis and a hardware technology analysis are reported as well as the PPCS system design and a typical mode of automatic screening operation. (Author)

AD-A108 792/3 PC **A12**/MF **A01**
General Electric Co., Daytona Beach, FL.
Advanced Weapon System (AWS) Sensor Prediction Techniques Study. Volume I.
Final technical rept. 14 Feb 80-11 May 81,
Carl F. R. Weiman. Sep 81, 253p RADC-TR-81-190-VOL-1
Contract F30602-80-C-0082
Original contains color plates: All DTIC and NTIS reproductions will be in black and white. See also Volume 2, AD-A108 793.

This study investigated, identified, and developed technology necessary to support efficient computer simulation of Advanced Weapon Systems (AWS) sensor images associated with low altitude flight. A main objective of the study was to delineate approaches to the solution of data base storage and processing problems characteristic of low altitude flight sensor image simulation. The tasks carried out to achieve this objective included analysis of scene content requirements, a survey of relevant computer graphics and image processing technology, and evaluation of experimental image generation algorithms carried out by General Electric. The functional description of a research laboratory system for sensor display simulation is presented.

AD-A108 793/1 PC **A08**/MF **A01**
General Electric Co., Daytona Beach, FL.
Advanced Weapon System (AWS) Sensor Prediction Techniques Study. Volume II.
Final technical rept. 14 Feb 80-11 May 81,
Carl F. R. Weiman. Sep 81, 165p RADC-TR-81-190-VOL-2
Contract F30602-80-C-0082
See also Volume 1, AD-A108 762.

This study investigated, identified and developed technology necessary to support efficient computer simulation of Advanced Weapon Systems (AWS) sensor images associated with low altitude flight. A main objective of the study was to delineate approaches to the solution of data base storage and processing problems characteristic of low altitude flight sensor image simulation. The tasks carried out to achieve this objective included analysis of scene content requirements, a survey of relevant computer graphics and image processing technology, and evaluation of experimental image generation algorithms carried out by General Electric. The functional description of a research laboratory system for sensor display simulation is presented.

AD-A108 794/9 PC **A11**/MF **A01**
Measurement Concept Corp., Rome, NY..
Intelligence Processor Performance Analysis (IPPA).
Final technical rept. 29 Feb 80-31 Mar 81,
Jim Cantrell, Roger Poland, and Jim Labout. Jul 81, 240p RADC-TR-81-207
Contract F30602-80-C-0099
Prepared in cooperation with Bunker Ramo Corp.

This report has documented the functional design that was developed for an AN/GYQ-21(V) hardware monitor. The report provides a concept of monitoring to place the development of the hybrid monitor in its proper perspective. The report defines the measurement set the monitor will measure. The functional design includes both the software and hardware components with the rationale for their use to be able to monitor the measurement set selected. The software specifications include tasks such as coordination between the host processor and monitor, measurements, and measurement reporting. Foremost in the designer's mind has been the ease of user interface with the monitor. The hardware/specifications include such areas as packaging, power requirements, EMI/RFI emissions, Qualifier Logic, and special modules. The report includes a theory of operations that references the design and specifications and provides an insight into functional breakout by measurement requirements. (Author)

AD-A108 817/8 PC **A03**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Initial Experience with a Local Network -- Net/One by Ungermann-Bass, Inc.
Technical rept.,
Philip H. Enslow, Jr., Paul D. Manno, and Jeanette T. Myers. Oct 81, 26p Rept no. GIT-ICS-81/11
Contract N00014-79-C-0873

Net/One, the local area network produced by Ungermann-Bass, has been installed and operated in the Georgia Tech Fully Distributed Processing System's (FDPS) testbed. Currently Net/One interfaces with Prime 400, Prime 550, and PDP 11/45 computers which are located in the computer lab and several different types and brands of ASCII, asynchronous terminals. This report includes a description of the design and operation of the various Net/One components, a discussion of the rational for the selection of Net/One for installation in the FDPS testbed, our initial experiences with Net/One including problems encountered and their solutions, and concludes with a description of the plans for future enhancements to its operation. (Author)

AD-A108 818/6 PC **A03**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
A Remote Terminal Emulator for Prime Computers.
Technical rept.,
Daniel H. Forsyth, Jr. Aug 81, 34p Rept no. GIT-ICS-81/12
Contract N00014-79-C-0873

A remote terminal emulator is a device that emulates sources of on-line input to a computer system, and is one of the most reliable tools for measuring the performance of time-shared computer systems. The remote terminal emulator described in this report provides simultaneous emulation for a number of communication lines as well as the software necessary for the preparation of scripts (a sequence of actions to be performed by the emulator) the setup and control of test sessions, and the analysis of test results. (Author)

AD-A108 819/4 PC **A03**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
A Simulation Tool for Distributed Databases.
Technical rept.,
Nancy D. Griffeth. Sep 81, 32p Rept no. GIT-ICS-81/15
Contract N00014-79-C-0873

An experimental software tool for simulating the behavior of distributed algorithms is proposed. The primary motivation for developing the tool is to study distributed database algorithms. Also, a classification of techniques presently used for distributed database problems of concurrency control and recovery is presented. This classification will be used to reduce the experimentation necessary to compare the performance of alternative algorithms. The study and development of distributed algorithms in general and distributed database algorithms in particular is behavior of distributed systems. Both intuition and present-day analytical tools are inadequate to characterize their behavior. Another barrier to understanding such algorithms is the complexity of their interaction, due to the potential lack of synchronization between nodes of a distributed system. Finally, it is not yet clear what 'good' behaviors are reasonable to expect from a distributed system. As a result, a multitude of algorithms may exist for solving a single problem, but without more experience and analysis, their behavior cannot be well understood or compared. This report describes an approach to providing the experience necessary for understanding the behavior of these algorithms. (Author)

AD-A108 820/2 PC **A03**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
A Re-Usable Code Generator for PRIME 50-Series Computers.
Technical rept.,
T. Allen Akin. Aug 81, 40p Rept no. GIT-ICS-81/16
Contract N00014-79-C-0873

This thesis describes the design and implementation of a language-independent reuseable code generator for Prime 400 and 50-Series computers. A code generator is the portion of a compiler that converts an internal representation of the semantics of a program into equivalent machine code. Construction of a code generator requires a major effort, so it should be done as infrequently as possible. One way to make this possible is to build a code generator that may be re-used from compiler to compiler. Several factors influence the design of such a code generator, including the nature of the communications channel between the code generator and the rest of the compiler, the structure of the information passed to the code generator (the 'intermediate form'), the form of output code desired, and finally the limitations of the machine architecture and existing systems software. The code generator implemented processes a high-level, tree-structured intermediate form, performing translation by case analysis and optimization by eliminating redundant load operations. It produces a stream of assembly language source code which may then be assembled, loaded, and executed. Experience with two compiler implementations has shown that the reusable code generator approach is feasible. However, several improvements in the present code generator would be desirable. (Author)

AD-A108 824/4 PC **A02**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Unbounded Speed Variability in Distributed Communications Systems.
Technical rept.,
John H. Reif, and Paul G. Spirakis. 1981, 19p Rept no. TR-14-81
Contract N00014-80-C-0647, Grant NSF-MCS79-21024

This paper concerns the fundamental problem of synchronizing communication between distributed processes whose speeds (steps per real time unit) vary dynamically. Communication must be established in matching pairs, which are mutually willing to communicate. We show how to implement a distributed local scheduler to find these pairs. The only means of synchronization are boolean 'flag' variables, each of which can be written by only one process and read by at most one other process. (Shared variables are very difficult to implement in the case the processes are running in different processors in a communication network.) No global bounds in the speeds of processes are assumed. Processes with speed zero are considered dead. However, when their speed is nonzero then they execute their programs correctly. Dead processes do not harm our algorithms' performance with respect to pairs of other running processes. When the rate of change of the ratio of speeds of neighbour processes (i.e. relative acceleration) is bounded, then any two of these processes will establish communication within a constant number of steps of the slowest process with high likelihood. So, our implementation has the property of achieving relative real time response. We can use our techniques to solve other problems such as resource allocation and implementation of parallel languages such as CSP and Ada. Note that we do not have any probability assumptions about the system behavior, although our algorithms use the technique of probabilistic choice. (Author)

AD-A108 825/1 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Real-Time Synchronization of Interprocess Comunication.
Technical rept.,
John H. Reif, and Paul G. Spirakis. 1980, 43p Rept no. TR-23-80
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

This paper considers a fixed (possibly infinite) set of distributed asynchronous processes which at various times are willing to communicate with each other. We describe probabilistic algorithms for synchronizing this communication with boolean 'flag' variables, each of which can be written by only one process and read by at most one other process. The use of flag variables seems as to require the fewest assumptions possible without considering specific systems. A process is considered to be tame over a time interval delta if its speed varies within certain arbitrarily fixed nonzero bounds. We show our synchronization algorithms have realtime response: If a pair of processes are mutually willing to communicate within a time interval delta and the pair are tame on delta, then they establish communication within delta with high likelihood (for the worst case behavior of the system). Our communication model and synchronization algorithms are quite robust. They are applied to solve a large class of real time resource synchronization problems, as well as real time implementation of the synchronization primitives of Hoare's multiprocessing language CSP.

AD-A108 827/7 PC **A03**/MF **A01**
MITRE Corp., Bedford, MA.
Computer Security Bibliography.
Technical rept.,
Anne-Marie G. Discepolo. Nov 80, 33p Rept no. MTR-8199
Contract F19628-81-C-0001

This paper presents a categorized bibliography of published reports and papers on computer security. (Author)

AD-A108 828/5 PC **A03**/MF **A01**
MITRE Corp., Bedford, MA.
Industry Trusted Computer System Evaluation Process.
Technical rept.,
E. T. Trotter, and Peter S. Tasker. 1 May 80, 27p Rept no. MTR-3931
Contract F19628-80-C-0001

The purpose of this document is to propose a process by which trusted computer system developments may be reviewed and evaluated under the DOD Computer Security Initiative Program. A trusted computer system is one which employs sufficient hardware and software integrity measures to allow its use for simultaneously processing multiple levels of classified and/or sensitive information. This document describes a process by which manufacturers may submit their proposed products for evaluation, and by which a government-wide evaluation center may conduct the review and evaluation. The criteria for evaluation of a trusted computer system are described, as well as the proposed roles of the manufacturer and the center.

AD-A108 829/3 PC **A02**/MF **A01**
MITRE Corp., Bedford, MA.
Trusted Computer Systems - Glossary.
Technical rept.,
George A. Huff. Mar 81, 24p Rept no. MTR-8201
Contract F19628-81-C-0001

A Trusted Computer System is a computer system that employs sufficient hardware and software integrity measures to allow its use for the simultaneous processing of multiple levels of classified or sensitive information. This glossary was prepared for distribution at the Third Computer Security Initiative Seminar held at the National Bureau of Standards, November 18-20, 1980. Emphasis is on terms which relate to the formal specification and verification of such systems. (Author)

AD-A108 830/1 PC **A05**/MF **A01**
MITRE Corp., Bedford, MA.
History of Protection in Computer Systems.
Technical rept.,
John D. Tangney. 15 Jul 80, 82p Rept no. MTR-3999
Contract F19628-80-C-0001

This report documents a lecture delivered at the NSA Computer Security Workshop on 19 March 1980. The subject of the lecture was the evolution of information protection features in commercially available general purpose computing systems. The lecture covered features built into both computer hardware and operating systems in an attempt to prevent programs of one user from stealing, modifying, or destroying programs of other users and of the operating system. This report is more than just a script for the lecture. In explaining certain features, it goes into much greater detail than is covered during the actual lecture, especially when presenting those hardware features considered essential to the development of trusted operating systems. This report should be useful to readers interested in the multilevel computer security problem. An appendix is included which provides contextual information about the multilevel security problem and the need for trusted operating systems. (Author)

AD-A108 831/9 PC **A03**/MF **A01**
MITRE Corp., Bedford, MA.
Specification of a Trusted Computing Base (TCB),
G. H. Nibaldi. 30 Nov 79, 27p Rept no. M79-228
Contract F19628-80-C-0001

A Trusted Computing Base (TCB) is the totality of access control mechanisms for an operating system. A TCB should provide both a basic protection environment and the additional user services required for a trustworthy turnkey system. The basic protection environment is equivalent to that provided by a security kernel; the user services are analogous to the facilities provided by trusted processes in kernel-based systems. This report documents the performance, design, and development requirements for a TCB for a general-purpose operating system. The information in this report is made available to stimulate technical discussion among industry and government personnel.

AD-A108 832/7 PC **A03**/MF **A01**
MITRE Corp., Bedford, MA.
Proposed Technical Evaluation Criteria for Trusted Computer Systems.
G. H. Nibaldi. 25 Oct 79, 48p Rept no. M79-225
Contract F19628-80-C-0001

The DoD has established a Computer Security Initiative to foster the wide-spread availability of trusted computer systems. An essential element of the Initiative is the identification of criteria and guidelines for evaluating the internal protection mechanisms of computer systems. This report documents a proposed set of technical evaluation criteria. These criteria and any evaluation process that they might imply represent one approach to how trusted systems might be evaluated.

AD-A108 855/8 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Guided-Wave Electro-Optic Analog-to-Digital Converter.
Journal article,
Frederick J. Leonberger. 1981, 6p MS-5640, ESD-TR-81-315
Contract F19628-80-C-0002
Pub. in SPIE, v269 p64-68 1981.

No abstract available.

AD-A108 929/1 PC **A02**/MF **A01**
California Univ., San Diego, La Jolla. Center for Human Information Processing.
The Design of an Interface to a Programming System and MENUNIX: A Menu-Based Interface to UNIX (User Manual).
Technical rept.,
Gary Perlman. Nov 81, 19p Rept no. 8105
Contract N00014-79-C-0323

This report consists of two papers on MENUNIX, an experimental interface to the programs and files on the UNIX operating system. In the first paper, I discuss how the decisions about the design of MENUNIX were made: based on my intuitions and user comments, but also on psychological theory and data whenever available. MENUNIX presents both the programs and files of UNIX in two menus from which users can make selections with single keypresses. The FILE menu presents the UNIX file hierarchy that allows users to organize files into directories by subject (e.g. writing and programming). The PROGRAM menu presents UNIX programs in a hierarchy organized into workbenches according to the tasks for which they are used (e.g. writing and programming) much as files can be organized in directories. Special facilities are provided for: finding out about useful commands; using variables to set options, to save commands, and to avoid typing long strings; and for editing strings (including recent commands). The second paper is a tutorial user manual for MENUNIX, in which the features of the program are more fully explained. (Author)

AD-A108 974/7 PC **A06**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Performance of Distributed and Decentralized Control Models for Fully Distributed Processing Systems. Initial Simulation Studies.
Final technical rept. 1 Jul 80-30 Jun 81,

Philip H. Enslow, Jr., and Timothy G. Saponas. Jul 81, 103p Rept no. GIT-ICS-81/09
Contract F30602-78-C-0120

An essential component of a Fully Distributed Processing System (FDPS) is the distributed and decentralized control. This component unifies the management of the resources of the FDPS and provides system transparency to the user. In a previous study, the problems of distributed and decentralized control were analyzed resulting in the specification of several control models. This study continues that work by further specifying the control models defined in the first report and comparing the performance of these models in various environments. This performance analysis is accomplished by means of simulation experiments. The results of the experiments indicate that the control message traffic generated by the distributed and decentralized control is much less than expected and probably does not present a barrier to the implementation of FDPSs. Comparison of the results of the simulation of a uniprocessor and that of an FDPS indicate that little or no loss of performance is experienced by the FDPS. An important limitation of these initial performance studies is the fact that user traffic is not included in this series of tests. (Author)

AD-A108 976/2 PC **A05**/MF **A01**
Interactive Systems Corp., Littleton, CO.
A Hierarchical Pattern Extraction System for Hexagonally Sampled Images.
Final rept. 1 Mar-1 Sep 81,
Laurie D. Gibson, and Charles T. Lenzmeier. Oct 81, 88p AFOSR-TR-81-0845
Contract F49620-81-C-0039

The objective of this research was to study the application of Generalized Balanced Ternary (GBT), a hierarchical coordinate system, and its related data structures to the problem of extracting line and area data (vectors) from rasterized images. GBT allows the pixels in an image to be aggregated over regions of different sizes. In the raster to vector process certain descriptors are calculated for these aggregates. They describe the general raster pattern within the aggregate region. Algorithms were developed to vectorize by examining the descriptors rather than the pixel data. The algorithms were implemented in software and tested on sample data. The results indicate this approach is promising and suggest ways to improve the algorithms. (Author)

AD-A108 979/6 PC **A06**/MF **A01**
SRI International, Menlo Park, CA.
Techniques for Automatic Deduction.
Final rept. Jul 79-Jul 81,
Robert E. Shostak, P. M. Melliar-Smith, and Richard L. Schwartz. Oct 81, 106p AFOSR-TR-81-0853
Contract F49620-79-C-0099

This report covers progress on a 2-year research effort toward the development of new theorem-proving methods for program verification, and the empirical investigation of these methods in actual verification systems. The research conducted during the course of the project focused on methods for simplifying formulas of the kind that arise frequently in the verification of programs. The importance of simplification methods, as opposed to pure proof methods, was pointed up by verification work conducted under a previous AFOSR contract. Perhaps the most significant outcome of the project is the development of an experimental theorem prover that has been used extensively in the proof of correctness of the design of a fault-tolerant operating system developed under NASA support. We believe that the technology embodied in this experimental system could be successfully applied to the development of a production verification system. (Author)

AD-A109 026/5 PC **A02**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
Metaphor: An Inescapable Phenomenon in Natural Language Comprehension.
Interim rept.,
Jaime G. Carbonell. 4 May 81, 25p Rept no. CMU-CS-81-115
Contracts N00014-79-C-0661, F33615-78-C-1551

Interpreting metaphors is an integral and inescapable process in human understanding of natural language. This paper discusses a method of analyzing metaphors based on the existence of a small number of generalized metaphor mappings. Each generalized metaphor contains a recognition network, a basic mapping, additional transfer mappings, and an implicit intention component. It is argued that this method reduces metaphor interpretation from a reconstruction to a recognition task. Steps towards automating certain aspects of language learning are also discussed. Part II analyzes analogical mappings underlying metaphors and implications for inference and memory organization. Regularities have been observed indicating that certain types of conceptual relations are much more apt to remain invariant in analogical mappings than other relations, resulting in an induced invariance hierarchy. The central thesis is that human inference processes are governed by the same analogical mappings manifest as metaphors in language.

AD-A109 031/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
GPRINT: A LISP Pretty Printer Providing Extensive User Format-Control Mechanism.
Memorandum rept.,
Richard C. Waters. Oct 81, 23p Rept no. AI-M-611
Contracts N00014-80-C-0505, N00014-75-C-0643

A pretty printer is presented which makes it easy for a user to control the format of the output produced. The printer can be used as a general mechanism for printing, data structures as well as programs. It is divided into two parts: a set of formatting functions, and an output routine. Each formatting function creates a sequence of directions which specify how an object is to be formatted if it can fit on one line and how it is to be formatted if it must be broken up across multiple lines. Based on the line length available, the output routines decides what structures have to be broken up across multiple lines and produces the actual output following the directions created by the formatting functions. The directions passed from the formatting functions to the output routine form a well defined interface: a language for specifying formatting options. Three levels of user format-control are provided. A simple template mechanism makes it easy for a user to control certain aspects of the format produced. A user can exercise much more complete control over how a particular type of object is formatted by writing a special formatting function for it. He can make global changes in format by modifying the formatting process as a whole. (Author)

AD-A109 045/5 PC **A02**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
PRINTR:- A Text and Graph Plotting System with Expanded Capabilities.
Technical memo.,
G. F. Forsyth. Jul 81, 14p Rept no. ARL/AERO-TM-333

A system for using control character sequences to extend a printer's character set and to more efficiently handle graph data and drawings has been written as a machine language program for the PDP8 computer with electrostatic plotter. Features added to text files include Greek and mathematical symbols, superscripts, two levels of subscripts and overstruck (superimposed) bars, dots and combined bars and dots. Plot files have two modes using 8 or 12 bit data words and may be either continuous scan or byte addressed. Plot and Text files may be mixed but not superimposed. (Author)

AD-A109 047/1 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
On the Power of Probabilistic Choice in Synchronous Parallel Computations.
Technical rept.,
John H. Reif. Nov 81, 32p Rept no. TR-30-81
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

This paper introduces probabilistic choice to synchronous parallel machine models; in particular parallel RAMs. The power of probabilistic choice in parallel computations is illustrated by O(log n) time algorithms for connectivity and recognizing bipartite graphs and O(log n) squared time algorithms for testing if a graph has a perfect matching, testing in time O(n) irreducibility of polynomials over finite fields. We characterize the computational complexity of time, space, and processor bounded probabilistic sequential RAMs. We show that parallelism uniformly speeds up time bounded probabilistic, sequential RAM computations by nearly a quadratic factor. We also show that probabilistic choice can be eliminated from parallel computations by introducing nonuniformity. (Author)

AD-A109 076/0 PC **A02**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA.
Flexible Parsing.
Annual rept. 1 Jul 80-30 Jun 81,
Philip J. Hayes, and Raj Reddy. 12 Oct 81, 16p
AFOSR-TR-81-0852
Contract F49620-79-C-0143

In the first phase, the implementation of the FlexP parser was completed according to the design described in last year's annual report, and was evaluated through use in a gracefully interacting interface. This application showed: that FlexP was able to parse both grammatical and ungrammatical input according to a simple grammar of pattern-matching rewrite rules, that the bottom-up approach of FlexP was helpful in the case of ungrammatical input, and that a grammar suitable for use by FlexP could be defined in terms natural to the domain of interaction of the interface. However, the experimental use of FlexP also made it clear that FlexP had certain problems, largely due to the uniform nature of its grammar. In the second phase, the set of design choices on which FlexP was based was reviewed to determine if it was possible to resolve the problems that FlexP had without also losing the desirable aspects of its performance. This review led to the replacement of a single parsing strategy based on linear pattern matching with an approach based on multiple construction-specific parsing strategies. This approach was evaluated in a preliminary way through the construction of two small parsers, CASPAR and DYPAR, and was found to show considerable promise. Accordingly, design based on the same approach was begun for a more complete parser for restricted domain natural languages, and for a parser oriented towards an artificial command language of the type common in interactive user interfaces.

AD-A109 134/7 PC **A07**/MF **A01**
Alfred P. Sloan School of Management, Cambridge, MA.
A Study of the Multicache-Consistency Problem in Multi-Processor Computer Systems.
Technical rept.,
Tarek K. Abdel-Hamid, and Stuart E. Madnick. Sep 81, 146p Rept nos. M010-8109-06, TR-6
Grant N00039-78-G-0160

This paper is a report on an ongoing research project at the M.I.T. Sloan School of Management to study the multicache-consistency problem in multi-processor computer systems. The nature of the consistency problem in multicache memory systems is briefly discussed, together with an explanation of the three common approaches proposed in the literature to handle it. A new solution to the problem, called the 'Common-Cache/Pended Transaction Bus' (CC/PTB) approach, is developed and discussed. The 'CC/PTB' approach attempts to minimize performance degradation by eliminating the overhead of maintaining cache-consistency. Its two distinctive features are: Firstly, the conventional private cache per processor organization is replaced by one where a pool of cache-modules is commonly shared by all processors. Secondly, the Pended Transaction Bus (PTB) is used as the interconnection protocol that connects the processors and the cache-modules. The performance of the CC/PTB approach is evaluated using a highly detailed simulation model with favorable results. (Author)

AD-A109 136/2 PC **A04**/MF **A01**
JRS Industries, Inc., San Diego, CA. Technical Services.
Study and Experimentation of Horizontal Microprocessor Machine Description Techniques.
Final rept. Apr-Nov 81,
John L. Gieser, and Robert J. Sheraga. 1 Nov 81, 69p ARO-18012.1-S-EL
Contract DAAG29-81-C-0018

This document reports on the research and investigation aspects of microarchitecture description methodologies. Its primary objectives are: (1) to identify the methodology that appears to have the most promise for use in an automatic microcode generation system; and (2) to define the means for developing the necessary tools and techniques needed for further evaluating this methodology. In automatically generating microcode from a high level source language, a significant issue is the description of the target microengine architecture. The techniques and methodologies used to accomplish this must address the practical issues of: (1) a detailed description of all microprogrammed controlled hardware elements of the microengine, the

microinstruction, the rules for valid use of all microprogrammed features, and the behavior of microprogrammed operations; and (2) the use of this description to interpret and decode higher level source intermediate language to form microoperations and ultimately microinstructions. This work is a step in conceptually defining the techniques and methodologies for microarchitecture descriptions to accomplish the above. (Author)

AD-A109 145/3 PC **A03**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Interactive Digital Correlation Techniques for Automatic Compilation of Elevation Data.
Research note,
F. Raye Norvelle. Oct 81, 44p Rept no. ETL-0272
See also Rept. no. ETL-R021, AD-A103 392.

A program using digital correlation techniques has been implemented on the Digital Image Analysis Laboratory (DIAL) to extract elevation data automatically from stereoscopic pairs of digital images. The DIAL enables the operator to view on a display unit the stereoscopic model and the computed match-point coordinates in 3-D using anaglyphic techniques. The match points are presented as 3-D profiles superimposed over the 3-D terrain model, and consequently, the operator can observe the compilation process, detect errors as soon as they occur, and interact with the process to prevent the accumulation of error or to tune the parameters as conditions warrant. The program is described in terms of the hardware, the algorithm, the operating procedures, and the examples of compiled areas. (Author)

AD-A109 163/4 PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Computer Science.
Natural Language Access to Databases: Interpreting Update Requests,
Jim Davidson, and S. Jerrold Kaplan. 30 Sep 81, 24p
Grant N00039-80-G-0132

For natural language database systems to operate effectively in practical domains, they must have the capabilities required by real applications. One such capability is understanding and performing update requests. The processing of natural language updates raises problems not encountered in the processing of queries. These difficulties stem from the fact that the user will naturally phrase requests with respect to his conception of the domain, which may be a considerable simplification of the actual underlying database structure. Updates which are meaningful and unambiguous from the user's standpoint may not translate into reasonable changes to the underlying database. Update requests may be impossible (cannot be performed in any way), ambiguous (can be performed in several ways), or pathological (can be performed only in ways which cause undesirable side effects). Drawing on work in Linguistics and Philosophy of Language, we have developed a domain-transparent approach to identifying and performing 'reasonable' changes in response to a user's update request, using only knowledge sources typically present in existing database systems. A simple notion of 'user model' and explanation with respect to the user's state of knowledge are central to the design. This paper describes a system PIQUE (Program for Interpreatation of Query/Update in English), which implements this approach. (Author)

AD-A109 189/1 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Best Available Technologies (BATs) for Computer Security.
Interim rept.,
Carl E. Landwehr. 21 Dec 81, 27p Rept no. NRL-8554

Over more than a decade, government, industry, and academic centers have invested substantial resources in techniques for developing secure computer systems. The major projects to develop such systems are surveyed from the perspective of a system developer about to undertake the design and implementation of a secure software system. Experience with specific techniques and applications is summarized, and recommendations are given. Suggested approaches to each phase of the system life cycle are provided. The principal recommendations to developers are that they consider the security requirements of each system as part of its functional requirements, rather than as a separate set of requirements; that they continue to think about security throughout the design and implementation of the system; and that they use the best available software engineering technology. (Author)

AD-A109 195/8 PC **A03**/MF **A01**
Human Resources Research Organization, Alexandria, VA.
Supplemental Guide: Sources of Information for On-Line Implementation for ISD 1.5 Select Instructional Setting.
Final rept. Jan-Oct 79,
Russel E. Schulz. Dec 79, 34p HUMRRO-RP-ED-79-9, ARI-RP-80-24C
Contract DAHC19-78-C-0010
See also ARI-RP-80-24A, AD-A109 203, ARI-RP-80-24B, AD-A109 196, ARI-RP-80-13, AD-A088 918 and ARI-RP-80-14, AD-A088 919.

The purpose of the research was to develop and evaluate a guide for the computer implementation of a manual Job Aid previously developed (ARI Research Products 80-13 and 80-14). The manual Job Aid of the prior research provided 'how to do it' guidance for selected activities identified in the Instructional Systems Development Model. The present document provides a supplementary manual for instructional developers who will use the Job Aid for Selecting Instructional Setting in the computer mode. Companion documents (ARI Research Products 80-24a and 80-24b) provide the developmental history of the Programming Design Guide, which is intended to enable computer programmers to implement a manual Job Aid on any computer system, and the actual guide. (Author)

AD-A109 196/6 PC **A08**/MF **A01**
Human Resources Research Organization, Alexandria, VA.
Programming Design Guide for Computer Implementation of Job Aid for Selecting Instructional Setting.
Final rept. Jan-Oct 79
Russel E. Schulz, William G. Underhill, and Carol S. Hargan. Dec 79, 153p HUMRRO-RP-ED-79-10, ARI-RP-80-24B
Contract DAHC19-78-C-0010
See also Rept. no. ARI-RP-80-24C, AD-A109 195.

The purpose of the research was to develop and evaluate a guide for the computer implementation of a manual Job Aid previously developed. (ARI Research Products 80-13 and 80-14.) The manual Job Aid of the prior research provided 'how to do it guidance' for selected activities identified in the Instructional Systems Development Model (ISD, TRADOC 350-30). The present document provides a Programming Design Guide which enables computer programmers to implement the manual Job Aid for Selecting Instructional Setting (ISD Block 1.5) on any computer system. Companion documents (ARI Research Products 80-24a and 80-24c) provide the developmental history of the Programming Design Guide and a supplemental handbook for instructional developers who will use thecomputer-based Job Aid. (Author)

AD-A109 203/0 PC **A02**/MF **A01**
Human Resources Research Organization, Alexandria, VA.
The Development of Programming Design Guides.
Final rept. Jan-Oct 79,
Russel E. Schulz, William G. Underhill, Carol S. Hargan, and Harold Wagner. Dec 79, 25p HumRRO-RP-ED-79-9, ARI-RP-80-24A
Contract DAHC19-78-C-0010
See also Rept. no. ARI-RP-80-24B, AD-A109 196.

The purpose of the research was to develop and evaluate a guide for the computer implementation of a manual Job Aid previously developed (ARI Research Products 80-13 and 80-14). The manual Job Aid of the prior research provided 'how to do it' guidance for selected activities identified in the Instructional Systems Development Model (ISD, TRADOC Pamphlet 350-30). The present document describes the conduct of the research activities involved in creating a Programming Design Guide. Companion documents (ARI Research Products 80-24b and 80-24c) provide the Programming Design Guide and a supplemental handbook for users of the computer-based Job Aid. (Author)

AD-A109 284/0 Not available NTIS
JRS Research Labs., Inc., Orange, CA.
Automatic Microcode Generation for Horizontally Microprogrammed Processors,
Robert J. Sheraga, and John L. Gieser. 1981, 17p
ARO-18012.2-S-EL
Contracts DAAG29-81-C-0018, DASG60-79-C-0068
Availability: Pub. in Annual Microprogramming Workshop (14th), 12-15 Oct 81, p154-168, Chatham, MA (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 293/1 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
Overview of the CHIP Computer.
Interim technical rept.,
Lawrence Snyder. 19 Aug 81, 13p Rept no. CSD-TR-377
Contracts N00014-80-K-0816, N00014-80-K-0360

The main question under study is how wide the corridor width should be for the switch lattice of the Configurable, Highly Parallel (CHiP) computer. (The CHiP computer family is introduced and its use for parallel algorithm composition is motivated.) It is argued on the basis asymptotic analysis that a constant corridor width is preferred even though such lattices cannot make full use of the processor elements for most complex interconnection patterns, e.g., universal interconnection structures like the cube connected cycles and shuffle exchange, and for certain 'simple' ones, e.g., certain planar graphs. (Author)

AD-A109 294/9 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
Programming Processor Interconnection Structures.
Interim technical rept.,
Lawrence Snyder. Oct 81, 28p Rept no. CSD-TR-381
Contracts N00014-80-K-0816, N00014-80-K-0360

Parallel computer architecture complicates the already difficult task of parallel programming in many ways, e.g., by a rigid interconnection structure, addressing complexity, and the shape and size mismatches. The CHiP computer is a new architecture that reduces these complications by permitting the processor interconnection structure to be programmed. This new kind of programming is explained. Algorithms are presented for several interconnection patterns including the torus and the complete binary tree and general embedding strategies are identified. (Author)

AD-A109 316/0 PC **A03**/MF **A01**
System Development Corp., Santa Monica, CA.
VM/370 Security Retrofit Program-Detailed Design and Implementation Phase.
Final rept.,
B. D. Gold, R. R. Linde, M. Schaefer, W. M. Shasberger, and D. H. Thompson. 21 May 78, 30p
Rept no. SDC-TM-6062/001/00
Contract MDA903-76-C-0260

This report describes a design strategy for performing a retrofit to IBM Corporation's Virtual Machine 370 (VM/370) system that will provide a time-shared environment in which user processes bearing differing military classification levels may be operated simultaneously without compromise to military security. The strategy entails drawing together into a secure kernel those system functions that may be exploited to violate security. This report finalizes the results of the first two years of an ongoing research and development program. (Author)

AD-A109 317/8 PC **A16**/MF **A01**
System Development Corp., Santa Monica, CA.
Formal Specifications of KVM/370 Kernel and Trusted Processes,
B. D. Gold, and D. H. Thompson. 21 May 78, 362p
Rept no. SDC-TM-6062/101/00
Contract MDA903-76-C-0260
See also AD-A109 318.

This document contains the formal specification of the kernel and trusted processes of the Kernelized VM operating system (KVM/370). The specification utilizes the specification language INA JO, a proprietary product of System Development Corporation. INA JO is described in TM-6021/000/00, January 1978. This document assumes familiarity with INA JO. The specification is divided into two main parts. Chapter two contains the specification of the kernel, and is split into nineteen sections corresponding to the main areas of functionality of the kernel. For the most part, little or no explanation of the kernel specification is provided; a prose description of each kernel function is contained in 'Preliminary Design of Security Kernel for KVM/370', TM-5855/200/00, October 1977. Chapter three contains the specifications of the trusted processes. Each of the five trusted process descriptions has two subsections. The first subsection for each trusted

process contains a prose description of the process, detailing its function. The second subsection contains the INA JO specification of the process. (Author)

AD-A109 324/4 PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Computer Science.
Good Layouts for Pattern Recognizers,
Howard W. Trickey. Aug 81, 16p Rept no. STAN-CS-81-871
Contract MDA903-80-C-0107, Grant NSF-MCS80-12907

A system to lay out custom circuits that recognize regular languages can be a useful VLSI design automation tool. This paper describes the algorithms used in an implementation of a regular expression compiler. Layouts that use a network of programmable logic arrays (PLA's) have smaller areas than those of some other methods, but there are the problems of partitioning the circuit and then placing the individual PLA's. Regular expressions have a structure which allows a novel solution to these problems: dynamic programming can be used to find layouts which are in some sense optimal. Various search pruning heuristics have been used to increase the speed of the compiler, and the experience with these is reported in the conclusions. (Author)

AD-A109 334/3 PC **A03**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Syntactic Visual Image Generation System Feasibility Study.
Final technical rept. Jun-Nov 81 on Phase 1.
Dec 81, 28p
Contract MDA903-81-C-0332, ARPA Order-4278

During phase 1 of the Syntactic Visual Image Generation program; Boeing has investigated several methods of implementing a pipelined multiprocessor - multimemory image generation system. Also, Boeing has assessed architectures for a fractal-object processor and has developed high level simulations to predict performance and architecture feasibility. Additionally, cost/performance analysis and possible VLSI implementation of the various architectures have been assessed.

AD-A109 396/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Linear Filtering Models for Texture Classification and Segmentation.
Journal article,
Charles W. Therrien. 1980, 5p MS-5348, ESD-TR-81-303
Contract F19628-80-C-0002
Pub. in Proceedings of the International Conference on Pattern Recognition (5th), p1132-1135 Dec 80.

No abstract available.

AD-A109 398/8 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
Formal Models of Capability-Based Protection Systems.
Interim technical rept.,
Lawrence Snyder. 10 Sep 79, 12p
Contract N00014-75-C-0752
Pub. in IEEE Transactions on Computers, vC-30 n3 p172-181 Mar 81. Report on BLUE CHiP Project.

No abstract available.

AD-A109 408/5 PC **A02**/MF **A01**
Southeastern Massachusetts Univ., North Dartmouth. Dept. of Electrical Engineering.
A Study of Texture Classification Using Spectral Features.
Technical rept.,
C. H. Chen, and Gia-Kinh Young. 4 Jan 82, 16p Rept no. SMU-EE-TR-82-1
Contract N00014-79-C-0494

Prior spectral feature study was not successful because of inaccuracy in 2-D spectral estimation. In this report, a generalization of Lim-Malik method is used to accurately estimate the ring and wedge spectral features for classification of textural images with a typical performance of over 80 percent correct classification for six texture classes. The results compare favorably with other texture features but require less computation using iterative algorithm. (Author)

N82-14464/3 PC **A03**/MF **A01**
Zeiss (Carl), Oberkochen (Germany, F.R.).
Electronic Image Analysis.
Final Report.
J. Gahm, R. Grosskopf, H. Jaeger, and F. Trautwein.
Dec 80, 50p BMFT-FB-T-80-126, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

An electronic system for image analysis was developed on the basis of low and medium cost integrated circuits. The printed circuit boards were designed, using the principles of modern digital electronics and data processing. The system consists of modules for automatic, semiautomatic and visual image analysis. They can be used for microscopical and macroscopical observations. Photographs can be evaluated, too. The automatic version is controlled by software modules adapted to various applications. The result is a system for image analysis suitable for many different measurement problems. The features contained in large image areas can be measured. For automatic routine analysis controlled by processing calculators the necessary software and hardware modules are available.

N82-14526/9 PC **A13**/MF **A01**
Centre National d'Etudes Spatiales, Toulouse (France).
Computer Program Design: Methodology, Reliability, and Quality Controlgenie Logiciel: Methodologie, Assurance et Controle Qualite.
E. Dorio. Jan 81, 289p CNES-NT-98
In French; English Summary.

Software methodologies are considered, including definition of program requirements, program design, coding, tests and maintenance. Project management on the levels of computer program production, verification, and certification is discussed. The need for discipline in software engineering practices in order to find realistic solutions to programming problems is emphasized. A program quality control method is presented as an example. Inspection techniques, operations organization, objectives and expected results are specified.

N82-14812/3 PC **A06**/MF **A01**
Engins Matra, Velizy (France).
Fabrication of a Processor Adapted to Numerical Filtering Realisation d'UN Processeur Adapte au Filtrage Numerique.
N. Karouche, and D. Jelsh. 1981, 121p TEL/KAR/81
Text in French.

A fast universal processor able to carry out numerical filtering operations in real time was designed and built. Two filtering algorithms were considered: transversal filtering (finite impulse response); and recursive filtering (infinite impulse response). The feasibility of such a universal structure was demonstrated. However, only the transversal filter could be realized, based on a microprocessor architecture. Performance of the filter is satisfactory.

N82-14813/1 PC **A06**/MF **A01**
SRI International, Menlo Park, CA.
Directions for Future Research and Development in Multicomputer Systems.
Final Report, Jun. 1981.
P. G. Neumann, D. H. Brandin, J. A. Goguen, J. Goldberg, and M. A. Placko. Sep 81, 110p BMFT-FB-DV-81-003, ISSN-0170-9011
Sponsored by Bundesministerium fuer Forschung und Technologie.

Research into multiprocessors, dispersed networks, local networks and distributed systems, data flow systems, highly parallel and internally concurrent systems, secure systems, and reliable and fault tolerant systems were surveyed. Multicomputer architectures are reviewed. The impact of programming languages on architecture, and vice versa, is considered. Theoretical computation models needed for describing systems are presented.

N82-14819/8 PC **A09**/MF **A01**
Technology, Inc., Houston, TX. Life Sciences Div.
Laboratory Data Manipulation Tools Basic Data Handling Programs. Volume 2: Detailed Software/Hardware Documentation.
Final Report.
30 Sep 81, 187p NASA-CR-167478-V-2
Contract NAS9-14880

The set of computer programs described allows for data definition, data input, and data transfer between the LSI-11 microcomputers and the VAX-11/780 minicomputer. Program VAXCOM allows for a simple method of textual file transfer from the LSI to the VAX. Program LSICOM allows for easy file transfer from the VAX to the LSI. Program TTY changes the LSI-11 operators console to the LSI's printing device. Program DICTIN provides a means for defining a data set for input to eithr computer. Program DATAIN is a simple to operate data entry program which is capale of building data files on either machine. Program LEDITV is an extremely powerful, easy to use, line oriented text editor. Program COPYSBF is designed to print out textual files on the line printer without character loss from FORTRAN carriage control or wide record transfer.

N82-14825/5 PC **A03**/MF **A01**
Centre de Recherches en Physique de l'Environnement Terrestre et Planetaire, Orleans (France).
Computer Program for Solving an Inverse Problem with One Variable: Part 1: Methodology Logiciel de Resolution d'UN Probleme Inverse a 1 Variable. 1: Expose des Methodes.
C. Delannoy, F. Lefeuvre, and C. R. P. E. Orleans.
Mar 81, 42p CRPE-NT-80-V-1-1
Text in French.

A nonnegative real function of one real variable is determined, using computer programming that integrates a certain number of known linear functionals. The program wants a maximum entropy solution. An approximation is made either through discretization or by finding a mean solution, i.e. the Dirichlet kernel. The program is capable of four operations: finding a discrete solution; finding a mean solution; finding a maximum entropy solution, initiated by and finding a maximum entropy solution, user interactively initiated. Random electromagnetic wave fields were analyzed with good results.

N82-14826/3 PC **A03**/MF **A01**
Centre de Recherches en Physique de l'Environnement Terrestre et Planetaire, Orleans (France).
Computer Program for Solving an Inverse Problem with One Variable. Part 2: User Manual Logiciel de Resolution d'UN Probleme Inverse a 1 Variable. 2: Documentation d'Utilisation.
C. Delannoy, and F. Lefeuvre. Apr 81, 41p CRPE-NT-81-V-2-2
Text in French.

The program is capable of four operations: (1) finding a discrete solution; (2) finding a mean solution; (3) find a maximum entropy solution, initiated by either (1) or (2); and (4) find a maximum entropy solution, user interactively initiated. The complete use of the program is explained, stressing the general nature of the software. A listing is shown for the numerical integration of five kernel functions.

N82-14829/7 PC **A11**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Ruggedized Minicomputer Hardware and Software Topics, 1981: Proceedings of the 4TH Rolm MIL-Spec Computer User's Group Conference.
Dec 81, 214p NASA-CP-2206, L-14886
Conf. Held in San Diego, Calif., 22-25 Feb. 1981.

No abstract available.

PB82-140864 Not available NTIS
National Bureau of Standards, Washington, DC.
Assessing the Performance of High-Level Computer Network Protocols.
Final rept.,
Wayne H. McCoy, Richard P. Collela, and Michael A. Wallace. Sep 81, 29p
Pub. in Proceedings of Protocol Testing - Towards Proof, INWG/NPL Workshop, Teddington, Middlesex, United Kingdom, May 27-29, 1981, 2, p25-53, Sep 81.

There are two aspects to assessing the performance of high-level network protocols: (1) establishing correct performance and (2) determining and evaluating measurable parameters of performance. The first of these is strongly related to software verification, while the latter is more related to system performance evaluation. In this paper, both aspects are discussed with regard to techniques that are being employed by the Institute for Computer Sciences and Technology (ICST) of the National Bureau of Standards (NBS). The ICST is developing a laboratory for experimentally assessing performance of network protocols. The principal objective of this laboratory is to test protocols that

have been proposed as draft standards for their viability as Federal Information Processing Standards (FIPS). Another goal is to determine certification methods and procedures for verifying compliance of a vendor's protocol to established FIPS. The protocols which are currently under development as prototype standards conform to the Open Systems Interconnection architecture of the International Standards Organization (ISO).

PB82-143017 PC **A09**/MF **A01**
Rochester Univ., NY. School of Medicine and Dentistry.
Application of Log-Linear Models to Statistical Record Linkage.
Final rept. 1 Mar 72-31 Mar 79,
Charles L. Odoroff. Oct 80, 178p NCHSR-81-242
Grant PHS-HS-00685

This research applies recent developments in the analysis of multidimensional contingency tables to the construction of automated record linkage systems. The study investigates how statistical methodology appropriate to the analysis of log-linear models may be applied to the record linkage problem; the development of computer programs to design the linkage rules; and the analysis of data from the record system for Strong Memorial Hospital in order to evaluate specific linkage rules. The record linkage problem consists of matching with minimum possible error the records of an individual in one data file with the records in another. Solutions to the problem have application in other areas of health research. The techniques are of value in designing and carrying out epidemiological and administrative studies which require matching of large data files and in the analysis of qualitative data.

PB82-147869 PC **A03**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Image Processing Lab.
Geometric Modeling Using Octree Encoding,
Donald Meagher. 1981, 50p IPL-TR-81-005, NSF/ECS-81010
Grant NSF-ENG79-04821

Results are described of an effort to devise a new 3-D geometric modeling scheme and associated linear growth algorithms in which objects of arbitrary complexity can be encoded, manipulated, analyzed, and displayed interactively in real time or close to real time in parallel, low cost hardware. Goals of the research were as follows: to develop the capability to represent any 3-dimensional or n-dimensional object to any specified resolution in a common encoding format; to operate on any object or set of objects with the Boolean and geometric operations; to implement a computationally efficient solution to the N-dimensional interference problem; to develop the capability to display in linear time any number of objects from any viewpoint with color, shadowing, transparent objects, multiple illumination sources, orthographic or perspective views and smooth edges; and, to develop a scheme that could be implemented across large numbers of inexpensive high-bandwidth processors. Octree encoding, a geometric modeling scheme, was developed to realize these goals.

PB82-147877 PC **A03**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Image Processing Lab.
Single-Pass, Chain Generating Algorithm for Region Boundaries,
Indranil Chakravarty. 1979, 36p IPL-TR-79-005, NSF/RA-790757
Grant NSF-ENG79-04821

An algorithm is described for converting region boundaries in an image array into chain encoded line structures. The primary objectives governing the development of the algorithm were to develop a scheme for encoding the line structure extracted from a gray line image and to develop a representation for the coded image that is suitable for further processing. The data structure used to represent a line segment is described and the three separate parts of the chain generation process are addressed. The problem of representing and encoding the intersection of line segments is examined and ways to determine whether one line segment intersects with another are noted. The effectiveness of the algorithm is demonstrated by a number of examples. The linked list representation for a line structure is shown to be a useful tool for scene analysis.

PB82-153594 PC **E03**/MF **E03**
Newcastle upon Tyne Univ. (England). Computing Lab.
Structuring Distributed Systems for Recoverability and Crash Resistance.
Technical rept.,
S. K. Shrivastava. c1979, 30p

An object oriented model of computation is used to discuss recoverability and crash resistance issues in distributed systems. The execution of a program at a node of the system can give rise to a hierarchy of processes executing various parts of the program at different nodes. Recoverability and crash resistance properties are needed to ensure that such a group of processes leave the system state consistent despite faults in the system. (Copyright (c) 1979 University of Newcastle upon Tyne.)

PB82-162645 PC **E07**/MF **E07**
Newcastle upon Tyne Univ. (England). Computing Lab.
Proceedings of the Joint SRC/University of Newcastle upon Tyne Workshop on VLSI (Very Large Scale Integration): Machine Architecture and Very High Level Languages Held in Lumley Castle, England on April 14-18, 1980,
Philip Colin Treleaven. Oct 80, 129p TR-SER-156
See also PB82-162652 thru PB82-162868.

The workshop presents reports relating to very large scale integration design methodology for highly parallel computer architectures which use very high level programming languages.

PB82-861501 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
CP/M Operating System. 1978-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1978-Feb 82.
Feb 82, 64p

Articles cited in this bibliography discuss the design, applications, and implementation of what may be the most widely-used microcomputer operating system in the world, CP/M. CP/M software including utility programs, text processors and editors, graphics systems, and peripheral device control programs are covered. Some articles compare CP/M with other operating systems and discuss the advantages and capabilities of each. (Contains 76 citations fully indexed and includes a title list.)

PB82-861790 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Error Detection Codes. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 189p
Supersedes PB81-861510.

Articles cited in this bibliography discuss the design, development, and implementation of error detection codes for use in computer software and hardware. A description of specific codes and a comparison of some codes, such as checksum versus residue codes for multiple error detection, are included. Other topics include a discussion of their effectiveness, estimates of reliability gain, models, and the state-of-the-art technology. Various applications such as error detection codes for binary data, picture signals, package failures, and detection and diagnosis of software malfunctions are also included. (This updated bibliography contains 201 citations, 29 of which are new entries to the previous edition.)

9C. Electrical and Electronic Engineering

AD-A109 314/5 PC **A02**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Evaluation of Parameters of the Oscillatory Motion of Digital Servo System in a Steady-State Mode,
V. P. Strakhov, and Ye. G. Kuznetsova. 4 Dec 81, 8p
Rept no. FTD-ID(RS)T-1267-81
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedeniy, Priborostroyeniye (USSR) v14 n6 p44-47 1971, by Robert D. Hill.

No abstract available.

AD-A109 386/3 PC **A02**/MF **A01**
Royal Signals and Radar Establishment, Malvern (England).
A Review of Millimetre Wave Devices,
A. J. Grant. Jun 81, 18p RSRE-MEMO-3372, DRIC-BR-81131

A review is given of recent improvements in the performance of power sources in the millimetre band, 30-300 GHz, corresponding to free space wavelengths from 1 cm down to 1 mm. Vacuum tube devices of interest include the magnetron, the TWT, the carcinotron or backward wave oscillator, the gyrotron or cyclotron resonance maser, and the recently discovered orbitron, which was demonstrated using an empty aluminium beer-can. Solid state sources have continued to make progress upwards in both frequency and power. Transferred electron devices using InP have produced 126 mW at 90 GHz, a level suitable for local oscillator applications, while Si impatts have demonstrated peak power of 13W at 94 GHz with 8% efficiency. The tunnett diode, a variation of the impatt in which tunnelling replaces avalanching, has shown useful power above 300 GHz.

N82-14446/0 PC **A07**/MF **A01**
Helsinki Univ. of Technology, Espoo (Finland).
Optimal Voltage Level Control and Its Application to Long Range Extension Planning in High Voltage Transmission Network.
Ph.D. Thesis.
Y. Laiho. 6 Mar 81, 136p ISBN-951-45-5116-2
Sponsored by the Foundation of Technology.

The work deals with the basic computer algorithms and their application long range network planning. The full a.c. load flow is calculated for every network state. Estimation for losses in each network state is obtained by performing a voltage level optimization routine. It finds the generator voltages, tap changer position and shunt compensation connections such that the losses are minimized simple method based on direct search was selected due to the significant mount of shut compensation equipment in the Finnish network that make the variables discontinuous. Losses are linearlized and expressed as a function voltage magnitude only. Sensitivity matrix is used to calculated these voltage changes. The inherently great need of computer storage to store this matrix and the long time to prepare it were overcome by assuming that small reactive power changes do not disturb the active power balance. This small approximation causes an error that is smaller than 1% but gives the benefit that the sensitivity matrix can be factorized and stored in a similar way to the Jacobia matrix used in load flow calculation. The optimization method has been proved to be feasible and fast in relatively large networks. It is in daily practical use at a utility. Numerical examples demonstrate the effect of corona losses on the optimal voltage level.

N82-14447/8 PC **A15**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Modeling and Analysis of Power Processing Systems (Mapps). Volume 1: Technical Report.
Final Technical Report, Oct. 1977 - Aug. 1980.
F. C. Lee, S. Rahman, R. A. Carter, C. H. Wu, and Y. Yu. Dec 80, 335p NASA-CR-165538, TRW-32660-6001-RU-01
Contract NAS3-21051

Computer aided design and analysis techniques were applied to power processing equipment. Topics covered include: (1) discrete time domain analysis of switching regulators for performance analysis; (2) design optimization of power converters using augmented Lagrangian penalty function technique; (3) investigation of current-injected multiloop controlled switching regulators; and (4) application of optimization for Navy VSTOL energy power system. The generation of the mathematical models and the development and application of computer aided design techniques to solve the different mathematical models are discussed. Recommendations are made for future work that would enhance the application of the computer aided design techniques for power processing systems.

9D. Information Theory

AD-A108 762/6 PC **A06**/MF **A01**
Analytical Technology Applications Corp., Sunnyvale, CA.
Ambiguity Surface Statistics and Overcontainment.
Final rept.,
Joseph LaPointe, Jr. 30 Sep 81, 117p Rept no. ATAC-SV8007-1
Contract N00014-80-C-0698

Cross-correlation algorithms can be used to detect a signal that is common to both channels. The current understanding of the performance of cross-correlation algorithms is based on the assumption that the processing and signal bandwidths are equal. Under these conditions, it is well known that the signal-to-noise power ratio (SNR) required to achieve a desired performance decreases as the integration time increases. However, in practice, it is usually necessary to use a processing bandwidth that is larger than the signal bandwidth (called signal overcontainment) because the signal bandwidth or the signal center frequency are only known approximately. The detection performance of cross-correlation algorithms is derived for the signal over-containment case. It is shown that the SNR can be decreased by increasing the signal overcontainment for small signal 'time-bandwidth' products. It is also shown that for moderate to large signal 'time-bandwidth' products, the SNR increases with increasing signal overcontainment, but that the SNR increases very slowly with increasing signal overcontainment. Image filtering algorithms can be used to enhance the features of an ambiguity surface and thereby improve the detection performance. The PFA at the output of these filters is easily related to the single cell threshold when the noise cells are independent.

AD-A108 918/4 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Convergence of Iterative Nonexpansive Signal Reconstruction Algorithms.
Journal article,
Victor T. Tom, Monson H. Hayes, Thomas F. Quatieri, and James H. McClellan. 12 Aug 80, 8p JA-5148, ESD-TR-81-318
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Acoustics, Speech and Signal Processing, vASSP-29 n5 p1052-1058 Oct 81.

No abstract available.

AD-A109 008/3 PC **A03**/MF **A01**
Southeastern Massachusetts Univ., North Dartmouth. Dept. of Electrical Engineering.
Time Delay Estimation: For Known & Unknown Signals.
Technical note,
C. H. Chen, and Shiunn-Jang Chern. 25 Nov 81, 50p Rept no. SMU-EE-TR-81-15
Contract N00140-81-Q-MM54

Time delay estimation using Hassab-Boucher windows is extensively examined by computer simulation for both known and unknown (random) signals. Optimum number of data segments is determined for the best result in time delay estimate. For the unknown signal case, the Burg's maximum entropy spectral estimation algorithm is used to estimate the signal spectral density used in the design of Hassab-Boucher windows. (Author)

9E. Subsystems

AD-A108 763/4 PC **A08**/MF **A01**
Worcester Polytechnic Inst., MA. Dept. of Electrical Engineering.
Computer Models for Conducting Surfaces.
Final technical rept. Sep 79-Sep 80,
Jitendra Singh. Aug 81, 170p RADC-TR-81-222
Contract F30602-79-C-0091

Under this effort work has been done to derive and use closed form expressions for generalized impedance parameters involving rectangular, conducting patches in free space. A galerkin model for the interaction between two wires, a wire and a patch and two patches has been developed. Basis functions sinusoidal in the direction of the current and triangular in the transverse direction have been used. Farrar's integration technique has been used so as to give most of the results of the model in closed form. (Author)

AD-A108 777/4 PC **A08**/MF **A01**
RCA Labs., Princeton, NJ.
High-Energy Ion Implantation for Multigigabit-Rate GaAs Integrated Circuits.
Final rept. 1 May 78-30 Jun 81,
S. G. Liu, E. C. Douglas, C. P. Wu, C. W. Magee, and S. Y. Narayan. Oct 81, 166p Rept no. PRRL-81-CR-32
Contract N00014-78-C-0367

The objectives of the program are to: (1) investigate high-energy ion implantation of donors into GaAs for multigigabit-rate GaAs integrated-circuit (IC) development and (2) to study the use of high-power lasers and other techniques for removing lattice damage and activating implanted species. GaAs ICs require the selective definition of n-layers in semi-insulating (SI) GaAs for the fabrication of active devices such as FETs, TELDs, and Schottky-barrier diodes. In order to fabricate such device elements, a capability for realizing n-layers with doping ranging from 10 to the 16th power to 5 x 10 to the 18th power/cc and thicknesses from 1 to o.15 micrometer is required. Until the inception of this program, the major effort on ion implantation into GaAs has been at energies less than 500 keV, which limits the implant depth to typically less than several hundred nanometers. During this program, high-energy implantation of Si into SI GaAs at energies of 30 to 1200 keV has been investigated. Projected ranges and straggles have been measured by secondary ion-mass spectrometry (SIMS). Based on these measurements, we have produced up to approx. 1-micrometer-thick n-type GaAs layers at doping levels of approx. 5 x 10 to the 16th power to 1 x 10 to the 18th power/cc by multiple-energy Si implantation.

AD-A108 795/6 PC **A08**/MF **A01**
Hazeltine Corp., Greenlawn, NY.
Design, Fabrication and Test of a Metal-Grid Angular Filter.
Final technical rept. Jun 80-May 81,
John F. Pedersen, and Peter W. Hannan. Nov 81, 167p 6436, RADC-TR-81-282
Contract F19628-78-C-0152

This final report describes the design, fabrication and test of a metalgrid spatial filter. The filter is a 5 x 5 foot flat panel incorporating 4 layers of crossed wire grids in a supporting structure of dielectric skins and dielectric honeycomb material. The spatial filter passes an electromagnetic wave incident within its angular passband centered on normal incidence, but reflects the wave if it is incident beyond about 30 degrees in the angular reject band. This result is obtained for any polarization of the wave. The filter operates at 9 GHz, and has a bandwidth of about 1 GHz for passing a wave at normal incidence. The measured characteristics of the spatial filter are close to those expected from analysis and previous tests of metal girds. There is more rejection for angles of incidence in the H plane than for incidence in the E plane. Placement of the spatial filter in front of a reflector antenna results in a significant reduction of antenna sidelobes beyond 30 degrees from the main beam in both the H plane and the E plane. There is only a slight degradation of the antenna sidelobes within the angular passband of the filter. (Author)

AD-A108 854/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
InP Optoelectronic Mixers.
Journal article,
Arthur G. Foyt, Richard C. Williamson, and Frederick J. Leonberger. 1981, 7p MS-5632, ESD-TR-81-314
Contract F19628-80-C-0002
Pub. in SPIE, v269 p109-114 1981.

No abstract available.

AD-A108 856/6 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Applications of InP Photoconductive Switches.
Journal article,
Frederick J. Leonberger. 1981, 7p MS-5696, ESD-TR-81-316
Contract F19628-80-C-0002
Pub. in SPIE, v272 p58-63 1981.

No abstract available.

AD-A108 921/8 PC **A02**/MF **A01**
Rome Air Development Center, Hanscom AFB, MA. Deputy for Electronic Technology.
Spread-Spectrum Devices Cater to New Systems,
Roger D. Colvin. 1980, 7p Rept no. RADC/ETR-81-0018
Pub. in MicroWaves, Feb 81.

No abstract available.

AD-A109 174/3 PC **A06**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Antenna (Selected Articles),
Yu. A. Yerukhimovich, Ye. G. Zelkin, R. A. Petrova, K. S. Shcheglov, and B. A. Poperechenko. 3 Dec 81, 105p Rept no. FTD-ID(RS)T-0939-81
Edited trans. of Antenny (USSR) n6 p17-49, 106-162 1969.

No abstract available.

DE82000831 PC **A04**/MF **A01**
Bendix Corp., Kansas City, MO.
Characterization and Comparison of Thermistor Thick Films. Topical Report.
R. W. Gehman. Sep 81, 56p BDX-613-2683
Contract AC04-76DP00613

Four thermistor thick film inks were evaluated for HMC production use. The physical, chemical and electrical properties of the wet inks and fired films were measured. Variations in the physical and chemical properties of the inks were used to explain variations in thermistor electrical resistance and temperature coefficient of resistance. (ERA citation 06:035350)

N82-14306/6 PC **A11**/MF **A01**
Technische Hogeschool, Eindhoven (Netherlands).
Integrated Schottky Logic.
Ph.D. Thesis.
J. Lohstroh. Nov 81, 232p

Integrated Schottky logic (ISL) is a bipolar logic concept that uses existing processes. It combines device structures, which are already known separately, with a very attractive type of logic gate which is used for high speed (VLSL), very large scale integration. Aspects of ISL, its performance in different processes, switching speed (calculated and measured), first order modeling, its behavior is a function of temperature, the noise margins as a function of temperature, and its applications are discussed. Bipolar circuits are compared with MOS circuits in general, and bipolar circuit technology combinations which satisfy VLSI requirements are discussed. A general noise margin test method is proposed, which is applicable to every type of logic circuit.

N82-14437/9 PC **A04**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
A Transmitting Solid State Linear Phased Array Antenna for C Band.
P. Doelman, and W. P. M. N. Keizer. Feb 80, 60p PHL-1980-10, TDCK-73844
Contract A78/K/040

An IMPATT diode transmiter phased array module, delivering 60 mW power at 5.75 GHz, was built. The oscillators in the transmitting modules consist of IMPATT diode sources and serve as injection locked elements in the antenna system. Details of the design and performance of the transmitter and its component parts, all constructed in microstrip, are given. Results for an antenna provided with eight transmitting modules, injection locked to a reference source, show that the measured radiation characteristics are in excellent agreement with those calculated. Loss in antenna gain due to mutual coupling is less than 2.6 db compared to broadside, for scan angles between 30 and 150 deg in the H plane.

N82-14445/2 PC **A11**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
Integrated Circuits for Accurate Linear Analogue Electric Signal Processing.
Ph.D. Thesis.
J. H. Huijsing. 1981, 229p

The main lines in the design of integrated circuits for accurate analog linear electric signal processing in a frequency range including DC are investigated. A categorization of universal active electronic devices is presented on the basis of the connections of one of the terminals of the input and output ports to the common ground potential. The means for quantifying the attri-

butes of four types of universal active electronic devices are included. The design of integrated operational voltage amplifiers (OVA) is discussed. Several important applications in the field of general instrumentation are numerically evaluated, and the design of operatinal floating amplifiers is presented.

N82-14463/5 PC **A03**/MF **A01**
Siemens A.G., Munich (Germany, F.R.).
Integrated Circuits for Industrial Controller Applications.
Final Report.
T. Freitag, G. Gehring, G. Weil, and W. Werner. Nov 80, 44p BMFT-FB-T-80-116, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

A family of drivers, sensors, and a bitprocessor were developed in order to obtain simple, cheap and flexible industrial control systems. Work on the bit processor was stopped at the layout stage. The process for LSTTL (Large Scale Transistor-Transistor Logic) integrated circuits was completely developed. Chip and assembly development of an integrated optical sensor is described.

N82-14467/6 PC **A03**/MF **A01**
Max-Planck-Inst. fuer Aeronomie, Katlenburg-Lindau (Germany, F.R.).
Low Power Hybrid Circuits for Satellite-Borne Time of Flight Spectrometers.
Final Report, Oct. 1980.
B. Wilken, and W. Weiss. Feb 81, 32p BMFT-FB-W-81-013, MPAE-T-74-80-25
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

A charge sensitive amplifier and an input discriminator for a time amplitude converter were developed for time of flight spectrometers, and tested as thin film hybrids. Time of flight spectrometers are very important tools for analyzing the ion composition of planetary and interplanetary magnetized plasma populations. The particle mass is obtained from simultaneous measurements of the particle energy and velocity. Application of this technique in satellite instruments requires low mass and low power circuits. The amplifier weighs 1.9 g and has a power consumption of 6.8 mW. The hybrid weighs 2.9 g with 100 mW power. The time walk is smaller than 200 psec over a dynamic range of more than 30.

N82-14468/4 PC **A02**/MF **A01**
Oxford Univ. (England). Dept. of Engineering Science.
Optimum Design of Wide-Bandwidth, Low-Noise Photodiode Amplifiers. Volume 1: Bandwidth.
D. K. Hamilton. 1981, 14p OUEL-1363/81-V-1

A circuit with video applications was tested. A reversed biased junction is a parallel combination of resistance and capacitance, which varies with the applied reverse voltage. The complete equivalent circuit model includes these components in parallel with a current generator. For optimum response at high frequency critical damping is necessary. The circuit allows the use of an amplifier with a wider open loop bandwidth than one compensated for unity gain, with a corresponding increase in system bandwidth.

N82-14469/2 PC **A02**/MF **A01**
Centre National d'Etudes Spatiales, Toulouse (France).
Evaluation of French Hybrid Microelectronics Evaluation de la Microelectronique Hybride Francaise.
M. Billot. Oct 80, 15p CNES-NT-97
In French; English Summary.

Thin and/or thick film technology of French manufacturers of hybrid circuits is assessed. Hybrid devices were subjected to mechanical and environmental life tests, and failure analysis was performed. Results show that both thick and thin deposition layers have good stability characteristics. The only significant difference is that thin films age better than thick films over the long-term at high temperature. Reproducibility of results for active components in the form of chips is poor when tested before they are incorporated into hybrid circuits. The principal cause of failure is identified as faulty interconnections for thick film active components.

N82-14471/8 PC **A04**/MF **A01**
Engins Matra, Velizy (France).
Study of an Autoadaptive Equalizer: Computerized Simulation Based on Kalman Filter or Gradient Methods Etude d'UN Egaliseur Auto-Adaptatif, Par Simulation sur Ordinateur, en Utilisant les Methodes de Filtrage de Kalman ou de Gradient.
B. Arbaud. 1981, 62p TEL/ARB/81
Text in French.

The principle of an autoadaptive equalizer is envisaged, specifically to deal with parasitic noise on data transmission lines. Data transmission is described and the necessity of an equalizer is shown. The appropriate mathematical tools are layed out and computerized simulation, along with results obtained, are explained. Programs that make use of Kalman numerical filtering are presented.

PAT-APPL-6-200 728 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Frequency Generator with Digitally Controlled Phase Modulation.
Patent Application,
Donald J. Adrian, Lawrence E. Christensen, and James C. Hanselman. Filed 27 Oct 80, 12p AD-D009 061/3
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A frequency generator is disclosed in which the phase modulation of a stable carrier frequency is precisely and repeatedly controlled by a digital input. A digital-to-analog converter (DAC) receives a digital input from the output of a computer and provides an analog voltage output. An analog ramp signal generator is also provided such that the output of the analog ramp signal generator and the output of the digital-to-analog converter form the inputs to a voltage comparator network. The output of the voltage comparator network switches state each time the ramp signal generator output exceeds the digital-to-analog converter output. The output of the voltage comparator network is used to trigger a one-shot multivibrator which thereby produces a square wave that is advanced or retarded in phase in response to the value of the digital input to the digital-to-analog converter.

PB82-152554 Not available NTIS
National Bureau of Standards, Washington, DC.
Spherical Scanning Data Processing: An Algorithm for Halving the Data Processing Effort When the Radiation Into the Back Hemisphere Is Negligible.
Final rept.,
Richard L. Lewis. Jun 81, 3p
Pub. in Proceedings of AP-S International Symposium Antennas and Propagation, Los Angeles, California, June 16-19, 1981, International Symposium Digest, 81CH 1672-5, 1, p247-249.

An algorithm has been developed, for probe-corrected spherical-scanning data processing, that halves the computational effort involved when the field is negligible in the back hemisphere of the antenna under test. As the algorithm is described, it is compared to the algorithm for data processing over the entire sphere, thus demonstrating that the computational effort involved is just half of that required by full-sphere data processing.

PB82-155516 PC **A02**/MF **A01**
Scottish Universities Research and Reactor Centre, East Kilbride.
A Flexible Multi-Scaler System with Micro-Processor Control,
J. Scobie, and M. Flynn. 1981, 10p SURRC-63/78

This report describes a multi-scaler system of small bulk, high degree of flexibility and low cost, based on a microprocessor kit and LS1 counter chips.

PB82-804113 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Antenna Sidelobe and Interference Reduction. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 216p
Supersedes PB80-815186, and NTIS/PS-79/1013.

The bibliography cites research covering techniques for sidelobe cancellation and interference rejection. Techniques include signal processing, beam forming, null steering, adaptive systems, phase shifters, element spacing, filters, and electromagnetic absorbing materials. (This updated bibliography contains 209 citations, 26 of which are new entries to the previous edition.)

PB82-861683 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Demodulators. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 175p
Supersedes PB81-851305.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

The design and applications of demodulators are presented in the cited reports. Topics include spacecraft communications, satellite transmissions, digital systems, signal filtering, phase shift keying, television transmission, and control of signal-to-noise ratio. Circuitry for the enhancement of weak signals is also included. (This updated bibliography contains 185 citations, 32 of which are new entries to the previous edition.)

PB82-861725 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Scanning Antennas. 1974-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1974-Feb 82.
Feb 82, 139p

Research studies and articles cited in this bibliography discuss the design, characteristics, theory, and applications of various types of scanning antennas. The radiation and scan characteristics, and the sidelobe and nulling properties are studied. Scanning antenna systems employing arrays such as phased arrays, dielectrically-loaded cylindrical arrays, terminated radial arrays, and silicon waveguide arrays are discussed. Recent advances in both electronically and mechanically scanning antenna systems are included. (Contains 134 citations fully indexed and includes a title list.)

PB82-861733 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Yagi-Uda Antennas. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 68p

Research studies and articles cited in this bibliography discuss the characteristics, performance, design, and application of Yagi-Uda antennas. Topics include a discussion of experimental and theoretical techniques for the calculation of radiation patterns, gain, and input impedance, as well as the design of Yagi antennas by nonlinear optimization techniques and by the aid of computers (CAD). Applications include the use of Yagi antennas in cars, radios, and television systems. Characteristics of various Yagi arrays and concentric loops are also discussed. (Contains 64 citations fully indexed and includes a title list.)

9F. Telemetry

AD-A108 797/2 PC **A04**/MF **A01**
MITRE Corp., Bedford, MA.
Analysis of Multipath Interference for APATS.
Technical rept.,
G. A. Robertshaw. Dec 81, 68p MTR-8366, ESD-TR-81-255
Contract F19628-81-C-0001

Multipath propagation and the resulting interference are theoretically analyzed for a ballistic missile re-entry vehicle (RV) to aircraft telemetry link in order to predict performance parameters for the ARIA Phased Array Telemetry System (APATS). A basic two-path model incorporating direct and specularly reflected transmission is presented. Model calculations, which take into account RV and APATS antenna gain, polarization, sea state and Doppler shift, yield the depth and frequency of fade anticipated for several mission scenarios. RF fades associated with RV antenna pattern nulls and modulation distortion resulting from a combination

of Doppler shift and relative path delay are tentatively identified as the principal sources of link degradation which will limit APATS support altitudes. Areas of continuing interest and work are described. (Author)

AD-A109 345/9 PC **A04**/MF **A01**
MITRE Corp., Bedford, MA.
Analysis of the Multipath Environment for APATS Testing.
Technical rept.,
G. A. Robertshaw. Nov 81, 51p MTR-8391, ESD-TR-81-254
Contract F19628-81-C-0001

Phase II of the ARIA Phased Array Telemetry System (APATS) test program will include tower-air-ground (TAG) testing of system sensitivity, tracking capability, and other functions. As presently envisioned, these test configurations involve propagation paths for which transmitter and receiver (APATS) heights are small relative to baseline separations and interference caused by multipath propagation must be considered in the context of the test objectives. A two-path propagation model which incorporates specular reflection from the earth is developed and calculations are performed for typical test configurations. The anticipated effects and ramifications of multipath interference are discussed and specific test configurations are recommended.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A109 039/8 PC **A02**/MF **A01**
Air Force Research and Technology Liaison Office, Golden, CO.
State-of-the-Art Review of Low-Cost Collector Technologies.
Final rept.,
William A. Tolbert. Jun 81, 13p DOE/SSO-4042-2

This report provides a brief but concise review of low-cost solar collector technologies and their potential for application within the military. The report covers low-cost, light-weight concepts for flat-plate collectors, parabolic trough collectors, heliostats and parabolic dish collectors. In addition, several criteria were evaluated with respect to low-cost collector technologies. These included reliability, maintainability, survivability, mobility/erectibility, environmental impact and economics. Research and development requirements and ongoing activities were also summarized. This report documents one of several ongoing state-of-the-art reviews of solar technologies performed by an Air Force liaison office with the Department of Energy. (Author)

N82-14633/3 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Aluminum Blade Development for the MOD-0a 200-Kilowatt Wind Turbine.
Final Report.
B. S. Linscott, R. K. Shaltens, and A. G. Eggers. Dec 81, 43p NASA-TM-82594, DOE/NASA-20370/20
Contract DE-AB29-76ET-20370

The rotor blade configuration, fabrication methods, analyses, operating experience, design modifications, and cost are described. Each 60-ft.-(18.3-m-) long aluminum blade used current aircraft fixed wing and rotary wing design and fabrication technologies. Structural damage, repairs, and modifications that occurred during 6500 hours of operation are summarized.

PB82-139627 PC **E05**/MF **E05**
International Inst. for Applied Systems Analysis, Laxenburg (Austria).
The Wisconsin-IIASA Set of Energy/Environment (WISE) Models for Regional Planning and Management: An Overview.
Final rept.,
W. K. Foell, J. S. Buehring, W. A. Buehring, R. L. Dennis, and M. E. Hanson. c1981, 150p ISBN-3-7045-0014-3, RR-81-17

This report presents an overview of the analytical framework and quantitative methods used in the IIASA case studies on Regional Energy/Environment Management and Planning. Its purpose is to summarize the structure of the models, to provide a complete listing of the sources of more detailed model and data descriptions, and to indicate how the models are integrated to provide a foundation for regional energy/environment policy maker analysis. The audience for the report includes managers, planners, technical advisors, and modelers. The set of models used in the research project encompasses socioeconomic links to the energy system; energy demand in the residential, industrial, commercial/service, agricultural and transportation sectors; the energy supply sector, environmental impacts associated with the energy system; and policy makers' preferences. The report gives a brief description of the purpose and general structure of each model, data requirements, examples of input and output, and model limitations. As a whole, the models integrate information about energy flows in a region to simulate the energy system and its relationship to other regional variables, e.g., demographic and economic trends and the environment.

PB82-149378 PC **A21**/MF **A01**
Office of Technology Assessment, Washington, DC.
As Assessment of Development and Production Potential of Federal Coal Leases.
1981, 479p OTA-M-150
Library of Congress catalog card no. 81-600178.

The main focus of the study is an estimation of the likely production, through 1991, from the existing 548 Federal coal leases in the seven major Western coal states. The likely effects of coal markets, environmental laws and regulations, transportation and socioeconomic factors, and other laws and regulations such as diligence were considered in arriving at production and capacity estimates.

PB82-152976 PC **A07**/MF **A01**
California Governor's Office of Appropriate Technology, Sacramento.
Local Energy Initiatives: A Second Look. A Survey of Cities and Counties, California, 1981,
Tom Tomasi. 1981, 135p
Prepared in cooperation with California Energy Commission, Sacramento, and Southwest Innovation Group, Inc., Pasadena, CA.

In 1980, the Office of Appropriate Technology (OAT), surveyed the energy activities of local government throughout California. Published as Local Energy Initiatives: A Survey of Cities and Counties, California 1980, the report based on that survey was distributed to all the state's local governments. Local Energy Initiatives: A Second Look, is an extension of the same project.

PB82-154295 Not available NTIS
National Bureau of Standards, Washington, DC.
Comparison of DOE-2-Generated Residential Design Energy Budgets with Those Calculated by the Degree-Day and Bin Methods.
Final rept.,
Tamami Kusuda, Ish Sud, and Taghi Alereza. 1981, 16p
Sponsored in part by Department of Energy, Washington, DC. Architectural and Engineering Branch.
Pub. in American Society of Heating, Refrigeration and Air-Conditioning Engineers Transactions 87, pt 1 p491-506 1981.

Residential design energy budgets for the buildings energy performance standards were generated by the use of the DOE-2 computer program for four different types of structures in 10 different localities throughout the U.S. The DOE-2 calculations for these conditions were repeated by simplified procedures using the degree-day and bin methods. By modifying the basis for the degree-day data from 65F to building specific value, remarkably close agreements were obtained between the DOE-2 and the degree-day results. Also, good agreements were obtained between the DOE-2 results and the ASHRAE TC4.7 method.

PB82-155573 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
The Effect of Price Developments on Energy Consumption in the Transport of Goods (Virkning av Pristiltak pa Energibruk i Godstransport),
Jan-Petter Soether. Mar 80, 42p ISBN-82-7133-304-6
Text in Norwegian.

The report indicates the possibilities of energy saving in goods transportations by means of taxes on energy. A doubling of fuel prices through higher taxes gives a 5% reduction in total energy used for goods transportation. Of this only 0, 15% are due to transfers between different modes of transportation. Transfer benefits increase very slightly if taxes are levied only on energy used for road transportation.

PB82-156118 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
The Dimension of Road Communications and Energy Consumption: An Analysis of Susceptibility (Kommunikasjonsomfang og Energibruk: Foelsomhetsanalyse),
Odd Gulbrandsen. Dec 79, 69p ISBN-82-7133-286-4
Text in Norwegian.

This report represents the results of a sensitivity study for the most important assumptions in a longterm general, system dynamics model for the study of energy problems in transportation. The model is constructed for analyses of means of saving energy in passenger car traffic when this is related to telecommunication, walk- and bicycle-systems and the rest of the community.

PB82-156134 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
The Oil Dependency of Traffic Transport: A Long-Range Systems-Dynamics Result Analysis (Samferdselens Oljeavhengighet: En Langsiktig Systemdynamisk Konsekvensanalyse),
Odd Gulbrandsen. Nov 80, 65p ISBN-82-7133-334-8
Text in Norwegian.

This paper describes analyses of policies in communication and transport. The long term effects of actions are studied. Measures are taken in the passenger- and telecommunication-sector. It is especially the effect on energy consumption and the vulnerability of the communication system under oil crises that are calculated. The analysis is based on a system dynamics model.

PB82-158064 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Pitfalls in Interior's New Accelerated Offshore Leasing Program Require Attention.
18 Dec 81, 100p EMD-82-26

The report discusses the Interior Department's new proposed 5-year offshore oil and gas leasing and development program. Significant changes in the program and the associated problems and issues that could affect the accomplishment of program goals are highlighted.

PB82-162900 PC **A03**/MF **A01**
Centro Informazioni Studi Esperienze, Milan (Italy).
An Instrumental Acoustic System for Early Diagnosis of the Rupture of Tube Systems,
A. Azzoni, S. Bevilaqua, A. Clapis, and G. Maino. Jun 80, 28p CISE-1612
Trans. of Un Sistema Strumentale per Diagnosi Precoci di Rotture di Fasci Tubiere, Milan 1980.

The report describes the application of an acoustic method for the early detection of loss of fluid at high temperature in power plants. The technique is based upon monitoring in an appropriate frequency band the noise existing in fluid under pressure or in ambient gas in a tubing system. The technique has been validated with optimal success, particularly in the case of high pressure boilers in the boiler feed water of steam generating plants. The instrumental surveillance system is extremely simple. The typical results obtained both in the experimental phase and in the actual industrial version will be reported.

10B. Power Sources

AD-A108 889/7 PC **A07**/MF **A01**
Solarex Corp., Rockville, MD.
Design of Mobile Photovoltaic Power Systems: 0.5-3 kW.
Final rept.,
Roy D. Gibson. 1 Oct 81, 133p
Contract DAAK70-80-C-0147

This contract effort can be summarized by four technical tasks: Task 1 - Analysis of Engine-Generator Inventory and Use for a less than 5 kW system; Task 2 - Parametric analysis of the Transportability of Photovoltaic System, i.e., the range of size and weight of transportable trailers and the associated PV generator size; Task 3 - Preliminary Cost Estimates for Photovoltaic Systems; and Task 4 - Preliminary Photovoltaic System Design. This report presents the results of Task 1 for the engine generator set planned inventory and characteristics. Task 1 also contained candidate photovoltaic system configurations which would be compared with the engine-generator characteristics identified in Task 1. A parametric study was made of sizing trade-offs between photovoltaic arrays and battery storage capacities which were capable of at least meeting the identified engine-generator characteristics and on structural designs for the photovoltaic array and storage battery for the two trailer configurations. The preliminary cost estimate support in Task 3 involved life cycle cost analysis for the system sizes studied in Task 1. The Task 4 preliminary system design support consisted of examining the results of Tasks 1, 2 and 3 and determining characteristics of transportable photovoltaic systems.

AD-A108 917/6 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Thin-Film GaAs Solar Cells.
Journal article,
John C. Fan, Robert W. McClelland, and Carl O. Bozler. 1981, 8p MS-5726, ESD-TR-81-317
Contract F19628-80-C-0002
Pub. in IEEE, p666-672 1981.

No abstract available.

AD-A109 263/4 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
A New Technique for Preparing p-n Junctions for Si Photovoltaic Cells.
Journal article,
John C. C. Fan, George W. Turner, Ralph L. Chapman, Thomas F. Deutsch, and Daniel J. Ehrlich. 1981, 6p MS-5525, ESD-TR-81-307
Contract F19628-80-C-0002
Pub. in Proceedings of the Fifteenth IEEE Photovoltaic Specialists Conference, p432-436 Jun 81.

No abstract available.

AD-A109 264/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
GaAs Shallow-Homojunction Solar Cells on Epitaxial Ge Grown on Si Substrates.
Journal article,
Ronald P. Gale, John C. C. Fan, George W. Turner, Bor-Yeu Tsaur, and Frances M. Davis. 1981, 5p MS-5531, ESD-TR-81-308
Contract F19628-80-C-0002
Pub. in Proceedings of the Fifteenth IEEE Photovoltaic Specialists Conference, p1051-1055 Jun 81.

No abstract available.

AD-A109 266/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
GaAs Shallow-Homojunction Concentrator Solar Cells.
Journal article,
George W. Turner, Ralph L. Chapman, John C. C. Fan, and Ronald P. Gale. 1981, 5p MS-5533, ESD-TR-81-310
Contract F19628-80-C-0002
Pub. in Proceedings of the Fifteenth IEEE Photovoltaic Specialists Conference, p151-155 Jun 81.

No abstract available.

DE81029542 PC **A02**/MF **A01**
United Technologies Corp., South Windsor, CT. Power Systems Div.
Improvement of Fuel Cell Technology Base. Progress Report No. 7, 1 April-30 June 1979.
1979, 23p FCR-1592
Contract AC03-76ET11301

The effort is devoted to improving fuel cell power section technology from the 4.8-MW Demonstrator baseline and providing technology and design support for the 40-kW power plant development program. Significant accomplishments were made and are discussed. Cell 8095, the long term cell represent the Demonstrator configuration has reached 23,920 hours of endurance. Testing of the first 2.2-ft exp 2 24-cell stack was completed after 2673 hours. Performance of GSA-6 cells was within 2 mV/cell of the performance goal despite accelerated decay testing and five times the anticipated shutdown rate. The second 3.7-ft exp 2 20-cell stack completed 3128 hours of testing of which 2263 hours were spent at 93 psia, 405 exp 0 F. The third 3.7-ft exp 2 20-cell stack was assembled and has run for 450 hours. Performance is above goal and edge seal leakage is extremely low, well below an acceptable level. The long term subscale cell with a GSB-1 cathode has accumulated 8556 hours. Efforts to incorporate the improved edge seal into the substrate on the continuous process machine continued. Subscale testing to investigate freeze losses continued. (ERA citation 06:035007)

NUREG-0873 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
A Bayesian Analysis of Diesel Generator Failure Data.
Technical rept.,
W. E. Vesely, P. K. Niyogi, F. F. Goldberg, and P. A. Weldon. Jan 82, 57p

A simple Bayesian approach has been developed to evaluate failure rate implications from the number of failures and number of successes in a given number of diesel tests. For the Bayesian approach, the diesel is modeled as having a constant probability of failure per trial which is unknown and whose possible values are describable by a probability distribution. The approach utilizes discrete probability distributions (probability mass functions) for ease of implementation. As a potential tool for the analyst, a computer code has been written to efficiently calculate the diesel posterior failure rate distributions for any input diesel test data and assumed prior distribution. The code can be used to monitor diesel tests for up-to-date failure rate implications. In addition, a wide variety of sensitivity analysis can be performed using the code.

N82-14202/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Comparative Analyses of Space-to-Space Central Power Stations.
P. F. Holloway, and L. B. Garrett. Dec 81, 49p
NASA-TP-1955, L-14766

The technological and economical impact of a large central power station in Earth orbit on the performance and cost of future spacecraft and their orbital transfer systems are examined. It is shown that beaming power to remote users cannot be cost effective if the central power station uses the same power generation system that is readily available for provision of onboard power and microwave transmission and reception of power through space for use in space is not cost competitive with onboard power or propulsion systems. Laser and receivers are required to make central power stations feasible. Remote power transmission for propulsion of orbital transfer vehicles promises major cost benefits. Direct nuclear pumped or solar pumped laser power station concepts are attractive with laser thermal and laser electric propulsion systems. These power stations are also competitive, on a mass and cost basis, with a photovoltaic power station.

N82-14626/7 PC **A05**/MF **A01**
Open Univ., Milton Keynes (England). Energy Research Group.
The Nuclear Controversy: Unequal Competition in Public Policy-Making.
I. Sanderson. May 80, 76p ERG-035

The public policy making process as regards nuclear power is analized and the epistemological basis for such an analysis is examined. It is asserted that disputes over the development of nuclear power are not primarily about the objective facts of the matter but rather derive from differences in basic assumptions about, and evaluatory perceptions of, society, technology and the nature of progress. The balance of power in such disputes is therefore not mainly determined by the 'correctness' of the facts upon which a position rests but rather by the extent to which underlying assumptions and values accord with prevailing ideological themes. A meaningful debate can be guaranteed only through the establishment of institutional structures which provide a framework of truely democratic participation and equality of power and influence.

N82-14627/5 PC **A08**/MF **A01**
DHR, Inc., Washington, DC.
Market Assessment of Photovoltaic Power Systems for Agricultural Applications in Morocco.
Final Report.
H. Steingass, and I. Asmon. Sep 81, 157p NASA-CR-165477, DOE/NASA/0180-2
Contracts DEN3-180, DE-AI01-79ET-20485

Results of a month-long study in Morocco aimed at assessing the market potential for stand-alone photovoltaic systems in agriculture and rural service applications are presented. The following applications, requiring less than 15 kW of power, are described: irrigation, cattle watering, refrigeration, crop processing, potable water and educational TV. Telecommunications and transportation signalling applications, descriptions of power and energy use profiles, assessments of business environment, government and private sector attitudes towards photovoltaics, and financing were also considered. The Moroccan market presents both advantages and disadvantages for American PV manufacturers. The principle advantages of the Moroccan market are: a limited grid, interest in and present use of PV in communications applications, attractive investment incentives, and a stated policy favoring American investment. Disadvantages include: lack of government incentives for PV use, general unfamiliarity with PV technology, high first cost of PV, a well-established market network for diesel generators, and difficulty with financing. The market for PV in Morocco (1981-1986), will be relatively small, about 340 kwp. The market for PV is likely to be more favorable in telecommunications, transport signalling and some rural services. The primary market appears to be in the public (i.e., government) rather than private sector, due to financial constraints and the high price of PV relative to conventional power sector.

N82-14629/1 PC **A03**/MF **A01**
Ross (Bernd) Associates, San Diego, CA.
Development of an All-Metal Thick Film Cost Affective Metallization System for Solar Cells.
Quarterly Report, Aug. - Oct. 1980.
B. Ross. Sep 81, 32p NASA-CR-165044, QR-2
Contract JPL-955688

An economical thick film solar cell contact for high volume production of low cost silicon solar array modules was investigated. All metal screenable pastes using base metals were studied. Solar cells with junction depths varying by a factor of 3.3, with and without a deposited oxide coating were used. Cells were screened and fired by a two step firing process. Adhesion and metallurgical results are unsatisfactory. No electrical information is obtained due to inadequate contact adhesion.

N82-14630/9 PC **A03**/MF **A01**
Ross (Bernd) Associates, San Diego, CA.
Development of an All-Metal Thick Film Cost Effective Metallization System for Solar Cells.
Quarterly Report, Nov. 1980 - Apr. 1981.
B. Ross. Sep 81, 40p NASA-CR-165043, DOE/JPL-955688-80/3
Contract JPL-955688

The objectives of the investigation were to provide all-metal screenable pastes using economical base metals, suitable for application to low-to-high conductivity silicon of either conductivity type and possibly to aluminum surfaces. Experiments were conducted with variations in paste parameters, firing conditions, including gas ambients, furnace furniture, silicon surface and others. A liquid medium, intended to provide transport during the carbon fluoride decomposition was incorporated in the paste with promising results.

N82-14631/7 PC **A02**/MF **A01**
Solarelectronics, Inc., Bellingham, MA.
Flat-Plate Solar Array Project. Task 1: Silicon Material: Investigation of the Hydrochlorination of SIC1SUB4.
Quarterly Report, 9 Jul. - 30 Sep. 1981.

J. Y. P. Mui. 1 Oct 81, 17p NASA-CR-165042, DOE/JPL-956061/1
Contract JPL-956061

A two inch-diameter stainless steel reactor was designed to operate at pressure up to 500 psig and at temperature up to 600 C in order to study the hydrochlorination of silicon tetrachloride and metallurgical grade (m.g.) silicon metal to trichlorosilane. The hydrochlorination apparatus is described and operation safety and pollution control are discussed.

N82-14634/1 PC **A16**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Satellite Power System: Concept Development and Evaluation Program. Volume 4: Energy Conversion and Power Management.
Nov 81, 369p NASA-TM-58237-V-4

Additional analyses that were performed to supplement the NASA/Department of Energy (DOE) Satellite Power System (SPS) reference system concept are presented in this volume. A brief review of the reference concept is provided together with detailed descriptions of energy conversion, power distribution, and power management for solar photovoltaics (silicon and gallium arsenide), solar thermal (Brayton and Rankine cycles), and concept comparisons (solar thermal and energy conversion). Results of other studies concerning energy conversion and power management (environmental impacts, annealing, nuclear SPS concept, and thermionic) are included. The data presented were taken from the SPS Concept Definition Studies performed under the direction of NASA by Rockwell International Corporation and Boeing Aerospace Company.

N82-14635/9 PC **A12**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Satellite Power System: Concept Development and Evaluation Program. Volume 7: Space Transportation.
Nov 81, 258p NASA-TM-58238-V-7

During the several phases of the Satellite Power System (SPS) Concept Definition Study, various transportation system elements were synthesized and evaluated on the basis of their potential to satisfy overall SPS transportation requirements and their sensitivities, interfaces, and impact on the SPS. Additional analyses and investigations were conducted to further define transportation system concepts that will be needed for the developmental and operational phases of an SPS program. To accomplish these objectives, transportation systems such as the Shuttle and its derivatives have been identified; new heavy-lift launch vehicle (HLLV) concepts, cargo and personnel orbital transfer vehicles (COTV and POTV), and intra-orbit transfer vehicle (IOTV) concepts have been evaluated; and, to a limited degree, the program implications of their operations and costs were assessed. The results of these analyses have been integrated into other elements of the overall SPS concept definition studies.

N82-14636/6 PC **A03**/MF **A01**
General Dynamics/Convair, San Diego, CA.
Study of Multi-Megawatt Technology Needs for Photovoltaic Space Power Systems. Volume 1: Executive Summary.
D. M. Peterson, and R. L. Pleasant. 1 Aug 81, 28p NASA-CR-165323-V-1, REPT-111-2401-204
Contract NAS3-21951

Possible missions requiring multimegawatt photovoltaic space power systems in the 1990's time frame and associated power system technology needs are examined. The following concepts for photovoltaic power approaches are considered: planar arrays, concentrating arrays, hybrid systems using Rankine engines, thermophotovoltaic and AC/DC power management approaches, battery, fuel cell, flywheel energy storage, and interactions with the electrical ion engine injection and stationkeeping system. The levels of modularity for efficient, safe, constructable, serviceable, and cost effective system design are analyzed, and the benefits of alternate approaches developed. Both manned low Earth orbit and unmanned geosynchronous Earth orbit applications were examined for technological development. Technology developments applicable to power systems which appear to have benefits independent of the absolute power level are suggested.

N82-14637/4 PC **A13**/MF **A01**
General Dynamics/Convair, San Diego, CA.
Study of Multi-Megawatt Technology Needs for Photovoltaic Space Power Systems, Volume 2.
Final Report.
D. M. Peterson, and R. L. Pleasant. 19 Mar 81, 285p NASA-CR-165323-V-2, GDC-AST-81-019-V-2
Contract NAS3-21951

Possible missions requiring multimegawatt photovoltaic space power systems in the 1990's time frame and power system technology needs associated with these missions are examined. Four specific task areas were considered: (1) missions requiring power in the 1-10 megawatt average power region; (2) alternative power systems and component technologies; (3) technology goals and sensitivity trades and analyses; and (4) technology recommendations. Specific concepts for photovoltaic power approaches considered were: planar arrays, concentrating arrays, hybrid systems using Rankine engines, thermophotovoltaic approaches; all with various photovoltaic cell component technologies. Various AC/DC power management approaches, and battery, fuel cell, and flywheel energy storage concepts are evaluated. Interactions with the electrical ion engine injection and stationkeeping system are also considered.

N82-14666/3 PC **A03**/MF **A01**
Bonn Univ. (Germany, F.R.). Inst. fuer Physikalische Chemie.
Electrodes and Diaphragms for Fuel Cells.
Final Report, Dec. 1979.
W. Vielstich, and E. Knauf. Feb 81, 45p BMFT-FB-T-81-047, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Nickel whisker electrodes with variations in network structure, pore size, and metal coatings were produced for use in water electrolytic cells and fuel cells. The resistance due to gas bubbles was decreased considerably by slits milled into the electrode. Platinization was optimized for use in glycol/air cells and glycol anodes with constantly good anode potentials were obtained with whisker structures by standardization of the platinization process. It is concluded that the activity of the glycol anodes depends strongly on the procedure of deposition of the noble metals and less on the whisker structure as such.

N82-14667/1 PC **A05**/MF **A01**
Centre National d'Etudes Spatiales, Toulouse (France).
Modal Analysis of Structures with Prestress Effects: Application to Flexible Solar Generators Analyse Modale de Structures Avec Effets de Recontrainte. Application aux Generateurs Solaires Souples.
B. Boissin. 20 May 81, 76p CNES-81/CT/PRT/SST/SM/178
Text in French.

A model of the dynamic behavior of a flexible solar array which is part of a satellite-borne solar generator for spacecraft power supply (4 to 10kW) is presented. Results are appropriate for solving problems of spacecraft attitude control. The array is depicted as a skin covered by solar cells. Modal characterization of prestressed structures is explained for the calculation of differential rigidity. The method is demonstrated for a beam loaded at each end and for a square plate loaded along two opposite sides. Results for an array which is deployed along a telescoping mast are shown.

PB82-151556 PC **A05**/MF **A01**
Water Resources Council, Washington, DC.
Water Assessment of Heber Commercial Geothermal Development Program, Imperial County, California (Section 13c),
Jan 81, 96p

The U.S. Water Resources Council, at the request of the U.S. Department of Energy, conducted an assessment of water needs, water availability and water resources impacts for the proposed 45 MWe Heber Binary Geothermal Demonstration Project in Imperial County, California.

10C. Energy Storage

AD-A109 038/0 PC **A02**/MF **A01**
Air Force Research and Technology Liaison Office, Golden, CO.
State-of-the-Art Review of Solar Ponds.
Final rept.,
William A. Tolbert. Apr 81, 16p DOE/SSO-4042-1

This report provides a brief but concise review of solar pond technologies and their potential for application within the military. The report covers salt gradient solar ponds (SGSP), shallow solar ponds (SSP), saltless convecting solar ponds, gel ponds, viscosity stabilized ponds, and membrane ponds. In addition, several criteria were evaluated with respect to solar ponds. These included reliability, maintainability, efficiency, survivability, environmental impact and economics. Research and development requirements and ongoing activities were also summarized. This report documents one of several ongoing state-of-the-art reviews of solar technologies performed by an Air Force liaison office with the Department of Energy. (Author)

PB82-862319 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solid Electrolytes for Sodium-Sulfur Batteries. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 124p
Supersedes PB81-862724.Prepared in cooperation with the Department of Energy, Washington, DC.

The development and applications of solid electrolytes for sodium-sulfur high temperature batteries are discussed. Emphasis is placed on cracking or fracturing of the electrolyte which results in cell short circuiting. Factors contributing to ionic conductivity are also considered. Methods of castings and control of porosity are treated. Problems associated with the thermal properties of the electrolyte are also discussed. (This updated bibliography contains 123 citations, 20 of which are new entries to the previous edition.)

PB82-862327 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Battery Electrolytes. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 49p
Supersedes PB80-808637.

This bibliography contains citations concerning the design, construction, and applications of solid, liquid, and gaseous battery electrolytes. Battery performance, maintenance, and safety are considered. (This updated bibliography contains 40 citations, 11 of which are new entries to the previous edition.)

PB82-862335 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Battery Electrolytes. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 73p
Supersedes PB80-808645.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning solid, liquid, and gaseous battery electrolytes. The design, performance, safety, and applications of the electrolytes are considered. Applications for the aerospace industry are discussed. (This updated bibliography contains 67 citations, 14 of which are new entries to the previous edition.)

PB82-862343 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Battery Electrolytes. 1972-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1972-Feb 82.
Feb 82, 320p
Supersedes PB80-808629.

This bibliography contains citations concerning solid, liquid, and gaseous battery electrolytes. Battery

design, use, and construction are discussed, and battery life, efficiency, and maintenance characteristics are also considered. (This updated bibliography contains 259 citations, 59 of which are new entries to the previous edition.)

11.

MATERIALS

11B. Ceramics, Refractories, and Glasses

AD-A108 796/4 PC **A07**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
Surface Modification in Control SiO2 Fiber Fracture.
Final technical rept. 22 Feb 79-22 Feb 81,
Roy Kaplow. Oct 81, 145p RADC-TR-81-292
Contract F19628-79-C-0055

It is known that corrosion resistance can be imparted to various materials by carefully controlling the chemical environment to which newly formed and atomically clean surfaces are initially exposed. We take the view that the embrittlement of silica (SiO2) is also a corrosion process, originating from the activated hydrolysis of siloxane (Si-O-Si) bonds by molecular water. Our approach considers that surface states of SiO2 can be altered by the presence of absorbed or chemisorbed gases so as to increase the activation energy required for the absorption of water vapor or alternatively to impede the dissociation of molecular water on silica surfaces. Either of these mechanisms should raise the activation energy involved in hydrolyzing siloxane bonds and thus lower the susceptibility for crack propagation. Gases containing straight or branched chain hydrocarbons are expected to reduce the absorption potential for H2O for the silics surface. Absorbed gases containing strong polar residues such as halogens are expected to establish a surface dipole layer which may repel the absorbing end of H2O and prevent its dissociation on the silica surface.

AD-A108 822/8 PC **A07**/MF **A01**
Catholic Univ. of America, Washington, DC. Vitreous State Lab.
Dynamical Nonlinear Material Response and Failure.
Interim technical rept. Oct 79-Jun 81,
C. J. Montrose, T. A. Litovitz, D. M. Heyes, Joseph H. Simmons, and R. K. Mohr. 1 Jul 81, 136p Rept no. CUA/VSL-010781
Contracts N00014-75-C-0856, N00014-81-K-0296

Molecular dynamics (MD) studies of the nonlinear viscoelastic response of Lennard-Jones model liquid and glassy systems have shown that strain-induced structural changes occur at elevated strain rates and are the microscopic origin of such phenomena as shear (viscosity) thinning and stress overshoot. The structural changes result in a limit to the steady state stress that the material can sustain. In terms of them it was possible to develop a framework for describing ductile failure and the ductile-to-brittle transition. The semiquantitative agreement of the MD results and primary laboratory studies in organic liquids, polymers and inorganic glasses suggests that the microscopic processes observed in the former are occuring in, and can be used to interpret phenomen in, the latter three. (Author)

AD-A109 087/7 PC **A05**/MF **A01**
Systems Research Labs., Inc., Dayton, OH. Research Applications Div.
Surface-Strengthening Mechanisms in Reaction-Bonded Si sub 3 N sub 4 and Subcritical Crack-Growth Behavior in Ceramics.
Final rept. 1 Aug 77-30 Sep 81,
M. G. Mendiratta. Nov 81, 79p SRL-6956, AFOSR-TR-81-0863
Contract F49620-77-C-0124

Reported herein are results of a number of investigations on: (1) strength and fracture toughness of oxidized, reaction-bonded (RB) Si3N4, (2) evaluation of chemical-vapor-deposition (CVD)-coated reaction-bonded Si3N4 and characterization and properties of controlled-nucleation-thermochemical-deposited (CNTD) silicon carbide, (3) subcritical-crack-growth (SCG) behavior of hot-pressed (HP)Si3N4 under mixed-mode loading conditions and SCG behavior of oxidized HP Si3N4, and (4) SCG behavior of Lithium-Aluminum-Silicate (LAS) glass-ceramics. The oxidation of RB Si3N4 at 900 C increases the strength by as much as 25%, presumably by blunting the flaw tips associated with open surface pores. The increase in fracture toughness is approximately the same. The 1500 deg C oxidation, on the other hand, does not provide effective flaw blunting and, in addition, an external silica scale is formed which cracks during cooling. At intermediate temperatures, the post-oxidation strength behavior is intermediate. The CVD-coated RB Si3N4 exhibited a significant loss of strength, even though a uniform, adherent coating was produced. The strength of HP Si3N4 under mixed-mode loading conditions indicated that the effect of the shear component of applied stress is minimal and that the SCG mainly occurs in Mode I. The pre-oxidation of HP Si3N4 decreased the SCG kinetics measurably, presumably due to the depletion of Ca and Mg from the glassy intergranular phase. The SCG behavior of LAS glass-ceramic also indicated that Mode I is the predominant mode of SCG even in the presence of Modes II and III. (Author)

AD-A109 204/8 PC **A07**/MF **A01**
General Electric Co., Philadelphia, PA. Re-entry and Environmental Systems Div.
Processing Research on Chemically Vapor Deposited Silicon Nitride.
Final technical rept. 1 Jun 80-31 Oct 81 on Phase 3,
R. A. Tanzilli, J. J. Gebhardt, and J. D'Andrea. Dec 81, 129p Rept no. 81SDR2111
Contract N00014-80-C-0575
See also report dated Dec 79, AD-A079 328.

The feasibility of preparing free standing plate and hemispherical domes of crystalline silicon nitride by the chemical vapor deposition (CVD) technique has been established as a result of processing research conducted on this program. Physical property characterizations of a wide range of deposits have established the CVD form of silicon nitride as a candidate electromagnetic (EM) window material for advanced, high-performance tactical missile systems. The EM absorption coefficients of CVD silicon nitride in the UV-IR and radar transmittance passbands are far superior to the more conventional silicon nitride modifications (i.e. HPSN and RSSN). At the current stage of process development, the flexure strength is comparable to RSSN exhibiting similar strength retention properties at elevated temperatures. Average room temperature flexure strength levels of 317 MN/sq m (46,000 psi) were achieved by codeposition with minor amounts of aluminum chloride during this program (Phase 3); this level represents a 150 percent increase in strength compared to levels achieved during the initial Phase 1 program. With a better understood deposition model now in hand, as a result of the Phase 3 program, a high probability exists in future process optimization studies for achieving additional improvements in the mechanical and optical properties of CVD alpha-silicon nitride.

N82-14302/5 PC **A06**/MF **A01**
Technische Univ., Berlin (Germany, F.R.). Inst. fuer Nichtmetallische Werkstoffe.
Preparation of Sinter Active Silicon Carbide Powders.
Final Report, Apr. 1980.
W. Boecker, H. Hausner, and H. Landfermann. Feb 81, 111p BMFT-FB-T-81-038, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Sinter active alpha SiC powders were prepared by processing of Acheson grade silicon carbide and beta SiC powders through the thermal decomposition of methylsilane. The sintering behavior of the powders when adding boron, aluminum or various compounds of these elements was investigated. The influence of various processing steps on the density and the microstructure of the silicon carbide is discussed. Sinter densities CH-110 or = 95% are achieved with both type of powders by sintering at temperatures of 2000 C.

N82-14332/2 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Effect of the Powder Characteristics of SISUB3NSUB4 on the Microstructure of Sintered Bodies.
G. Woetting, and H. Hausner. Nov 81, 15p NASA-TM-76619
Contract NASW-3198
Transl. Into English from Keramische Z. (West Germany), V. 32, No. 10, 1980 p 579-581. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Technische Univ., Berlin.

Silicon nitride powders sintered with the addition of 2 wt% Mg0 to 95% theoretical density after attrition milling and subsequent purification were evaluated. Preparation of the powders is described. The powder characteristics (specific surfaces, iron concentration, and oxygen content), and density, weight loss, and phase state of the sinter bodies as a function of powder preparation are presented.

N82-14359/5 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Ultrasonic Velocity for Estimating Density of Structural Ceramics.
S. J. Klima, G. K. Watson, T. P. Herbell, and T. J. Moore. 1981, 12p NASA-TM-82765, DOE/NASA/51040-35
Contract DE-AI01-77CS-51040
Presented at the Automotive Technol. Develop. Contractor Coord. Meeting, Dearborn, Mich., 26-29 Oct. 1981.

The feasibility of using ultrasonic velocity as a measure of bulk density of sintered alpha silicon carbide was investigated. The material studied was either in the as-sintered condition or hot isostatically pressed in the temperature range from 1850 to 2050 C. Densities varied from approximately 2.8 to 3.2 g cu cm. Results show that the bulk, nominal density of structural grade silicon carbide articles can be estimated from ultrasonic velocity measurements to within 1 percent using 20 MHz longitudinal waves and a commercially available ultrasonic time intervalometer. The ultrasonic velocity measurement technique shows promise for screening out material with unacceptably low density levels.

PB82-153115 PC **A04**/MF **A01**
Krauss-Maffei A.G., Munich (Germany, F.R.).
Trials with Artificial Sand Products in Steel-Foundries,
Friedrich Heczko. Aug 79, 73p BMFT-FB-HA-81-001
Trans. of mono. Versuche mit Kuenstlichen Sandprodukten in Stahlgiessereien, Bonn, 86p Apr 81.

Today molds for steel castings are mainly consisting of cold resins bonded quartz sand, which may cause silicosis when the workmen inhale dust-laden air in the foundry. By using corundum sand instead of quartz sand the risk of silicoses can be avoided. Corundum is highly heatproof and its dust does not create specific diseases. However, corundum is causing heavy wearing off and it is expensive. On the basis of special transportation and casting experiments the technical and commercial aspects on the practical use of corundum molding material were to be demonstrated. Pneumatic transportation tests have shown that the wearing off effects--due to extremely low transportation speed--remain within tolerable limits. Casting tests with relatively heavy steel casting have--under certain conditions--resulted in a proper setting of the corundum molds and in marketable castings. The possibility of regenerating the corundum sand has been proven. If by producing the raw material on a large-scale basis the corundum price is lowered, an economical use of the corundum sand in foundries will be possible.

PB82-862772 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cermets: Fabrication and Applications. 1975-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1975-Feb 82.
Feb 82, 200p
Supersedes PB80-808769.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the fabrication and applications of ceramic composites

and films. The mechanical, thermal, and electrical properties of these composite materials are discussed, and applications as insulators in MHD components and electron vacuum tubes and in solar collectors are considered. (This updated bibliography contains 193 citations, 57 of which are new entries to the previous edition.)

11C. Coating, Colorants, and Finishes

AD-A108 869/9 PC **A02**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
The Effect of Surface Coatings on the Fatigue Strength of Aluminum Alloys,
Dario A. Emeric, Sidney Levine, and Kathryn L. Washburn. Sep 81, 23p Rept no. MERADCOM-2339

Aluminum is a widely used metal in military applications such as vehicles, bridges, air-cushion vehicles, etc., but its use is limited to areas where the aluminum alloys would not be under load with variable or constant stresses and to areas where there would be almost no severe abrasion or corrosion. Anodic coatings tend to increase the abrasion and corrosion resistance of aluminum and its alloys, but the coatings have a detrimental effect on the fatigue endurance (in some instances by as much as 65 percent). The objective of this work was to provide a surface treatment and/or coatings that will allow the use of aluminum wrought alloys in any type of environment and that will be able to withstand the effects of abrasion and stress corrosion and temperature changes up to 344 deg F with an increased fatigue endurance. (Author)

N82-14333/0 PC **A05**/MF **A01**
Avco Lycoming Engine Group, Stratford, CT. Materials Lab.
Development of Improved High Temperature Coatings for In-792 + HF.
Final Report.
D. D. Profant, and S. K. Naik. Jun 81, 95p NASA-CR-165395
Contracts NAS3-22371, DA PROJ. 1L1-62209-AH-76

The development for t-55 l712 engine of high temperature for integral turbine nozzles with improved thermal fatigue resistance without sacrificing oxidation/corrosion protection is discussed. The program evaluated to coating systems which comprised one baseline plasma spray coating (12% Al-NiCoCrALY), three aluminide coatings including the baseline aluminide (701), two CoNiCrAly (6% Al) + aluminide systems and four NiCoCrY + aluminide coating were evaluated. The two-step coating processes were investigated since it offered the advantage of tailoring the composition as well as properly coating surfaces of an integral or segmented nozzle. Cyclic burner rig thermal fatigue and oxidation/corrosion tests were used to evaluate the candidate coating systems. The plasma sprayed 12% Al-NiCoCrAlY was rated the best coating in thermal fatigue resistance and outperformed all coatings by a factor between 1.4 to 2.5 in cycles to crack initiation. However, this coatings is not applicable to integral or segmented nozzles due to the line of sight limitation of the plasma spray process. The 6% Al-CoNiCrAlY + Mod. 701 aluminide (32 w/o Al) was rated the best coating in oxidation/corrosion resistance and was rated the second best in thermal fatigue resistance.

PAT-APPL-6-288 598 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Water-Displacing Paint.
Patent Application,
Charles R. Hegedus, and Kenneth G. Clark. Filed 30 Jul 81, 12p AD-D009 064/7
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A water-displacing paint is disclosed for coating metallic surfaces in humid environments to prevent corrosion. The paint comprises controlled proportions of a silicone alkyd resin to serve as a binder and physical barrier, solvents including ethyl acetate, aromatic mineral spirits and 1,1,1 trichlorotrifluorethane for ensuring water immiscibility, a petroleum sulfonate to inhibit corrosion and aid surface absorption, and an organo-titanate of isopropyl tri-titanate to promote surface adhesion. Selected amounts of titanium dioxide and zinc molybdate are included as pigments in one effective example of the paint to provide it a white color. Alternate colors may be produced conventionally by adding standard tinting pigments in amounts sufficient to yield the desired color. (Author)

PB82-856154 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Erosion of Epoxy Coatings. January, 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Feb 82.
Feb 82, 86p
Supersedes PB81-850026.

This bibliography contains citations concerned with causes and control of the erosion of epoxy coatings. Surface analyses and substrate pretreatments relative to epoxy resin coating adhesion failure are discussed. Innovations in epoxy resin polymer chemistry concerned with the development of more durable coatings are included. (This updated bibliography contains 73 citations, 15 of which are new entries to the previous edition.)

11D. Composite Materials

AD-A109 089/3 PC **A02**/MF **A01**
Technion - Israel Inst. of Tech., Haifa. Material Mechanics Lab.
Time Dependent Inelastic Behavior of Materials.
Final scientific rept. Jul 80-30 Jun 81,
Sol R. Bodner. Jul 81, 14p AFOSR-TR-81-0855
Grant AFOSR-80-0214

This period of the research program was devoted to solving problems of the inelastic response of composite elements under dynamic loading, examining wave propagation in rate dependent inelastic media, and studying the creep response of metals. The reference material representation was taken to be the constitutive equations of Bodner-Partom for elastic-viscoplastic work-hardening materials. In particular, a theory for the dynamic behavior of laminated slabs of elastic-viscoplastic materials has been developed. In addition, the constitutive equations were shown to provide realistic characterization of the time dependent inelastic behavior of metals ranging from creep to wave propagation conditions. (Author)

AD-A109 131/3 PC **A10**/MF **A01**
Wyoming Univ., Laramie. Dept. of Mechanical Engineering.
Moisture and Thermal Expansion of Composite Materials.
Interim rept.,
Douglas S. Cairns, and Donald F. Adams. Nov 81, 210p UWME-DR-101-104-1, ARO-16370.5-MS
Contract DAAG29-79-C-0189

An experimental technique is presented for determining the moisture and thermal expanbsion coefficients of polymers, and polymer-matrix composite materials. Materials tested included Hercules 3501-6 neat epoxy resin, Hercules AS/3501-6 graphite/epoxy composite and Owens-Corning S2 glass fibers in the same Hercules 3501-6 epoxy matrix. Correlations of the experimentally determined moisture and thermal expansion properties with a nonlinear finite element micromechanics analysis are presented. Thermal expansion results for all three materials, both dry and moisture-conditioned, were obtained. Diffusivity constants were also experimentally determined. It is demonstrated that the moisture and thermal expansion of composite materials can be determined experimentally, and predicted numerically with generally good results. (Author)

AD-A109 282/4 PC **A06**/MF **A01**
Vought Corp. Advanced Technology Center, Dallas, TX.
The Development of a Low Velocity Impact Methodology for Hybrid Material Systems.
Final rept. Apr 80-Apr 81,
S. V. Hayes, and E. F. Rybicki. Jul 81, 102p Rept no. ATC-R-92000/1CR-63
Contract N00019-80-C-0265

The development of a design methodology for hybrid structures which describes the extent of damage and associated failure modes due to low velocity impact has been undertaken. Hybrids can provide a synergistic improvement in damage resistance caused by foreign body low velocity impact over graphite/epoxy material and when properly designed, enhance the visual and NDI damage detection threshold of the baseline material. Improvements in the visible and NDI damage detectability threshold of graphite/epoxy material, subject to low velocity impact, via proper placement and use of Kevlar plies and metallic coatings within this baseline material were exhibited. Correlation between the math model and the extent of both visible and invisible damage test panels experienced when subjected to low velocity impact were used to validate the model. Residual strength tests of damaged panels were run to quantify the static strength reduction experienced in the panel due to varying levels of visible and invisible damage. Development of the math model was based upon physical parameters identified through experimental testing. These included transverse impact of hybrid and graphite/epoxy panels and tensile tests of the target materials at elevated strain rates. High speed photography of the impact event on the composite panels was used to provide the dynamic modes of failure for use in model.

AD-A109 352/5 Not available NTIS
Florida Univ., Gainesville. Dept. of Engineering Sciences.
Transverse Cracks in Glass/Epoxy Cross-Ply Laminates Impacted by Projectiles,
N. Takeda, R. L. Sierakowski, and L. E. Malvern. 15 Oct 80, 7p ARO-15989.1-E
Grant DAAG29-79-G-0007
Availability: Pub. in Jnl. of Materials Science, v16 p2008-2011 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14284/5 PC **A02**/MF **A01**
Indian Inst. of Tech., Bombay. Dept. of Aeronautical Engineering.
Hand-Operated Honeycomb Core Expansion Set-Up.
N. K. Naik, N. Rameshchandra, and G. R. Shevare. Sep 81, 16p AE-TN-810901

Honeycomb sandwiches as a design concept and adhesive bonding as a joining process have been combined by unique designs and processes to produce extremely efficient structural configurations. An attempt to design and fabricate a simple hand operated laboratory based honeycomb core expansion set-up is described. Locally available adhesives and aluminum foils are used for preparing the slabs for expansion.

N82-14285/2 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Bending Fatigue Tests on Sic-al Tapes under Alternating Stress at Room Temperature.
J. A. Herzog. Nov 81, 21p NASA-TM-76631
Contract NASW-3542
Transl. Into English Z. Fuer Metallk. (Germany, F.R.), V. 72, Mar. 1981 p 191-197. Original Language Document Was Announced as A81-27934. Transl. By Scientific Translation Service, Santa Barbara, Calif.

The development of a testing method for fatigue tests on SiC-Al tapes containing a small amount of SiC filaments under alternating stress is reported. The fatigue strength curves resulting for this composite are discussed. They permit an estimate of its behavior under continuous stress and in combination with various other matrices, especially metal matrices.

N82-14286/0 PC **A03**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Design, Fabrication and Test of Graphite/Polyimide Composite Joints and Attachments for Advanced Aerospace Vehicles.
Quarterly Technical Progress Report, 1 Dec. 1980 - 31 Mar. 1981.
J. B. Cushman. Apr 81, 47p NASA-CR-159114, QTPR-7
Contract NAS1-15644

Standard and advanced bonded joint concepts were evaluated to develop a data base for the design and analysis of advanced composite joints for use at elevated temperatures (561K (550F)). Design concepts for specific joint applications and the fundamental parameters controlling the static strength characteristics

of such joints were identified. Test results are presented for rail shear and sandwich beam compression tests and tension tests of moisture conditioned specimens and bonded on 'T' sections. Coefficients of thermal expansion data are presented for A7F (LARC 13 Amide-imide modified) adhesion. Static discriminator test results for type 1 and type 2 bonded and bolted preliminary attachment concepts are presented and discussed.

N82-14287/8 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Durability/Life of Fiber Composites in Hygrothermomechanical Environments.
C. C. Chamis, and J. H. Sinclair. 1981, 28p NASA-TM-82749, E-1065
Presented at the Sixth Conf. On Composite Mater.: Testing and Design Sponsored by the AM. Soc. For Testing and Mater., Phoenix, Ariz., 12-13 May 1981.

Statistical analysis and multiple regression were used to determine and quantify the significant hygrothermomechanical variables which infuence the tensile durability/life (cycle loading, fatigue) of boron-fiber/epoxy-matrix (B/E) and high-modulus-fiber/epoxy-matrix (HMS/E) composites. The use of the multiple regression analysis reduced the variables from fifteen, assumed initially, to six or less with a probability of greater than 0.999. The reduced variables were used to derive predictive models for compression an intralaminar shear durability/life of B/E and HMS/E composites assuming isoparametric fatigue behavior. The predictive models were subsequently generalized to predict the durability/life of graphite-fiber-r generalized model is of simple form, predicts conservative values compared with measured data and should be adequate for use in preliminary designs.

N82-14288/6 PC **A08**/MF **A01**
Wyoming Univ., Laramie.
Analysis of Crack Propagation as an Energy Absorption Mechanism in Metal Matrix Composites.
Interim Report, Sep. 1979 - Dec. 1980.
D. F. Adams, and D. P. Murphy. Feb 81, 159p NASA-CR-165051, UWME-DR-101-102-1
Grant NSG-3217

The crack initiation and crack propagation capability was extended to the previously developed generalized plane strain, finite element micromechanics analysis. Also, an axisymmetric analysis was developed, which contains all of the general features of the plane analysis, including elastoplastic material behavior, temperature-dependent material properties, and crack propagation. These analyses were used to generate various example problems demonstrating the inelastic response of, and crack initiation and propagation in, a boron/aluminum composite.

N82-14289/4 PC **A03**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Cologne (Germany, F.R.).
Colloquium on Composite Materials Verbundwerstoffe: Werkstoff Kolloquium.
1980, 27p
Text in German. Presented at Cologne, 3 Dec. 1980.

No abstract available.

N82-14303/3 PC **A02**/MF **A01**
Kunststoffen en Rubber Inst. TNO, Delft (Netherlands)
Examination of a Damaged Gun Shield of Ota Melara.
G. Hamm. 11 Jun 80, 5p KRI-204/80, TDCK-75033
Contract A80/KM/064

A glass fiber reinforced polyester gun shield that was damaged during service was studied. Visual inspection suggested that a large deformation of the dome, caused by large waves, produced high stresses in the laminate, causing local ruptures and collapse. Bending tests, shear tests, and glass content tests show no defect in the material, but stiffening ribs should be strengthened to increase load bearing capacity of the shield when faced with large waves.

N82-14476/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Numerical Stability of an Explicit Finite Difference Scheme for the Solution of Transient Conduction in Composite Media.
W. Campbell. Nov 81, 29p NASA-TM-82453

A theoretical evaluation of the stability of an explicit finite difference solution of the transient temperature field in a composite medium is presented. The grid points of the field are assumed uniformly spaced, and media interfaces are either vertical or horizontal and pass through grid points. In addition, perfect contact between different media (infinite interfacial conductance) is assumed. A finite difference form of the conduction equation is not valid at media interfaces; therefore, heat balance forms are derived. These equations were subjected to stability analysis, and a computer graphics code was developed that permitted determination of a maximum time step for a given grid spacing.

11F. Metallurgy and Metallography

AD-A108 980/4 PC **A04**/MF **A01**
Connecticut Univ., Storrs. Inst. of Materials Science.
Interaction of Microsegregation and Coarsening During Dendritic Nickel-Base Alloy Monocrystal Growth.
Final rept. 1 Apr 77-31 Aug 81,
T. Z. Kattamis. 31 Oct 81, 57p UC-MET-KAT-4-1981, AFOSR-TR-81-0860
Grant AFOSR-77-3344

Dendritic monocrystals of various Ni-Al-Ta and Ni-Al-Cr alloys, some of which were microalloyed with C,B,Zr or Hf were processed at various growth rates up to 200 cm/h, or cooling rates up to 4.44 K/s under a thermal gradient in the mushy zone of 80 K/cm and in some cases 180 K/cm. The solidification microstructure was substantially refined with increasing growth rate and dendrite arm spacings as fine as 1 to 2 micrometer were observed in laser or electron beam surface glazed monocrystals, corresponding to local cooling rates in excess of 100,000 K/s. Microsegregation of Al, Ta and Cr was found to depend on growth conditions. With increasing cooling rate, within the range of those encountered in monocrystal processing the volume fraction of nonequilibrium interdendritic upsilo minus upsilo prime eutectic or secondary upsilo prime increases. At the high growth rates achieved in surfae glazing this volume fraction is greatly reduced. Very high growth rates are required for complete elimination of interdendritic upsilo prime through solute trapping, and formation of a completely homogeneous surface layer. Such high rates could be reached during glazing. With the present chilling techniques available growth of homogeneous monocrystals at such high rates, which would enhance productivity, is not possible.

AD-A109 078/6 PC **A03**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Annapolis, MD. Ship Materials Engineering Dept.
Relative Effects of a Graphite Fiber Reinforced Epoxy Composite and Nickel-Aluminum Bronze on a Cathodic Protection System in Seawater.
Interim rept.,
Harvey P. Hack, and Aleksander B. Macander. Nov 81, 28p Rept no. DTNSRDC/SME-81/73

This study was designed to quantify the cathodic efficiency of a graphite fiber reinforced epoxy laminated composite material by comparing the amount of zinc consumption from a sacrificial-anode cathodic protection system on the composite with the consumption due to a nickel-aluminum bronze in seawater. Specimens of the composite or of bronze were electrically coupled to anode zinc in seawater at flow velocities of 0 and 10 meters per second for up to 270 days. The composite did not cause a significantly different current demand than bronze on the zinc sacrificial cathodic protection system. It was noted that this represents a worst-case condition for the composite, since the specimens were deliberately prepared with the graphite-fiber ends exposed on the test surface. (Author)

AD-A109 152/9 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Grain-Coarsening Resistance and the Stability of Second-Phase Dispersions in Rapidly Solidified Steels.
Technical rept. no. 1, Oct 80-Sep 81,
G. B. Olson, H. C. Ling, J. S. Montgomery, J. B. Vander Sande, and M. Cohen. 1 Dec 81, 9p
Contract N00014-81-K-0013

Control of alloy composition and processing to achieve grain coarsening resistance in rapidly solidified alloys is examined via the theory of grain boundary pinning and particle coarsening. The principles are illustrated for the case of manganese sulfides in steels. A thermodynamic survey of potential stable dispersed phases identifies TiN and rare-earth sulfides as particularly promising for alloy development via rapid solidification. (Author)

AD-A109 275/8 PC **A05**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Corrosion Fatigue.
Conference proceedings.
Oct 81, 93p Rept no. AGARD-CP-316
Presented at the Meeting of the AGARD Structures and Materials Panel (52nd), Cesme, Turkey, 5-10 Apr 81.

The objectives and scope of the AGARD Corrosion Fatigue Cooperative Testing Programme were described and plans developed for a supplemental programme of considerably wider scope. In addition, six papers were presented, stimulating thought on the fundamentals of corrosion fatigue and on its combat for real structures. (Author)

AD-A109 296/4 PC **A02**/MF **A01**
Lehigh Univ., Bethlehem, PA. Inst. of Fracture and Solid Mechanics.
Surface Reactions and Fatigue Crack Growth.
Technical rept.,
R. P. Wei, and G. W. Simmons. Aug 81, 20p Rept nos. IFSM-81-107, TR-11
Contract N00014-75-C-0543

Recent fracture mechanics and surface chemistry studies of environment assisted crack growth in gaseous environments have shown that crack growth may be controlled in some systems by the rate of surface reactions and in others by the rate of transport of the aggressive environment to the crack tip. Based on considerations of surface reactions and gas transport, a model for surface reaction and transport controlled fatigue crack growth in single component gaseous environments was proposed and experimentally verified. In practice, however, there is usually more than one gas in a given environment. The various component gases can compete for surface reaction sites and therefore alter the fatigue crack growth response. In this paper, the development of the model for surface reaction and transport controlled fatigue crack growth in single component gaseous environments is briefly reviewed. Modeling of fatigue crack growth in a binary gas mixture, in which one of the components acts as an inhibitor, is described, and the model is applied to the consideration of the influence of oxygen on fatigue crack growth in humid air. (Author)

AD-A109 297/2 PC **A02**/MF **A01**
Lehigh Univ., Bethlehem, PA. Inst. of Fracture and Solid Mechanics.
Fatigue Crack Growth in Aqueous and Gaseous Environments.
Technical rept.,
R. P. Wei. 1981, 17p Rept nos. IFSM-81-108, TR-12
Contract N00014-75-C-0543
Pub. in Environmental Degradation of Engineering Materials in Aggressive Environments, p73-81 1981.

No abstract available.

AD-A109 321/0 PC **A02**/MF **A01**
Battelle Columbus Labs., OH.
The Numerical Simulation of Crack Growth in Weld-Induced Residual Stress Fields.
Interim rept.,
M. F. Kanninen, F. W. Brust, Jalees Ahmad, and I. S. Abou-Sayed. Jul 81, 25p
Contract N00014-77-C-0516
Presented at the 28th Army Sagamore Research Conference, 13-17 Jul 81, Lake Placid, NY.

A marriage of elastic plastic fracture mechanics techniques with thermoplastic finite element analyses is developed to examine crack growth in the presence of weld-induced residual stresses. A hypothetical crack growth relation based on the crack tip opening displacement is used. Three problem areas are studied: stress corrosion cracking in a girth-welded pipe, fatigue crack growth under cyclic loading in a butt-welded plate, and dynamic crack propagation under impact loading in a butt-welded plate. Comparisons with computations carried out under conventional linear elastic assumptions are made. It is found that, in

all three cases, neglect of the plastic deformation caused by the welding process appears to be anti-conservative. It is concluded that more realistic computations for crack growth in and around welds than are commonly used may be needed for realistic structural integrity assessments. (Author)

AD-A109 323/6 PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
The Development of a Dynamic Elastoplastic Finite Element Analysis for Fast Fracture Under Impact Loading.
Interim rept.,
Jalees Ahmad, J. Jung, C. R. Barnes, and M. F. Kanninen. Jun 81, 29p
Contract N00014-77-C-0576
Presented at the ASME/PVP Conference, 22-25 Jun 81, Denver, CO.

Recent evidence has pointed to the possible inadequacy of elastodynamic treatments of rapid crack propagation and crack arrest. This paper describes the development of a dynamic elastic-plastic finite element capability designed to address this concern by taking direct account of crack tip plasticity. Comparisons with known dynamic fracture mechanics solutions and with experimental data are made to demonstrate the fidelity of the approach. A comparison with an elastodynamic solution in an impact loaded 4340 steel bend specimen is also made. This result reveals that a significant effect of crack tip plasticity may exist even for high strength materials. (Author)

AD-A109 347/5 Not available NTIS
Pennsylvania Univ., Philadelphia. Dept. of Materials Science and Engineering.
The Stress Analysis and Diffusional Growth of Microvoids Ahead of a Crack,
D. S. Wilkinson, and V. Vitek. 1980, 9p ARO-15934.7-MS
Contract DAAG29-78-C-0040
Prepared in cooperation with McMaster Univ., Hamilton (Ontario). Dept. of Metallurgy and Materials Science.
Availability: Pub. in Stress Analysis and Diffusional Growth of Microvoids, p243-258, n.d. (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 351/7 Not available NTIS
Florida Univ., Gainesville. Dept. of Materials Science and Engineering.
Comparison of Hydrogen and Oxygen Slow Strain-Rate Embrittlements,
R. E. Reed-Hill. 1980, 10p ARO-14096.3-MS
Contract EY-76-S-05-3262, Grant DAAG29-79-G-0050
Proceedings of International Conference on Effect of Hydrogen on Behavior of Materials (3rd), Moran, WY, 26-31 Aug 80.
Availability: Pub. in Hydrogen Effects in Metals, p873-880 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 388/9 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.
The Role of Environment on Time Dependent Crack Growth.
Technical rept.,
R. E. Ricker, and D. J. Duquette. Dec 81, 22p
Contracts N00014-67-A-0117-0012, N00014-75-C-0466

Gaseous as well as aqueous environments are known to accelerate time dependent crack growth under either static loading (SCC or HE) or dynamic loading conditions. In some cases, the rate controlling processes of these phenomena have been related to surface controlled reactions, while in other cases bulk reactions such as diffusion appear to be rate limiting. It is not entirely clear that the mechanisms of time dependent crack growth are identical for different environment/alloy couples, or for different ranges of loading conditions. This paper will attempt to examine the chemical aspects of environment/alloy interactions and to correlate those aspects with observed crack propagation rates under a variety of loading conditions at or near room temperature. Additionally, a brief discussion of the role of environment on elevated temperature fatigue crack growth will be presented. (Author)

AD-A109 395/4 Not available NTIS
Battelle Columbus Labs., OH.
A Dislocation Theory Approach to Wear,
A. R. Rosenfield. 5 Mar 81, 8p ARO-15689.8-MS
Contract DAAG29-78-C-0031
Availability: Pub. in Wear, v72 p97-103 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 399/6 PC **A02**/MF **A01**
Lehigh Univ., Bethlehem, PA. Inst. of Fracture and Solid Mechanics.
Rate Controlling Processes and Crack Growth Response.
Technical rept.,
R. P. Wei. Aug 81, 22p Rept nos. IFSM-81-106, TR-10
Contract N00014-75-C-0543
Pub. in Hydrogen Effects in Metals, Proceedings of the International Conference on Effect of Hydrogen on Behavior of Materials (3rd), 26-31 Aug 80, p677-690.

No abstract available.

DE82000261 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Dimensional Stability, Annealing Stabilization, and Residual Stress Analysis of alpha-Phase-Extruded Uranium-2.4 Weight Percent Niobium Alloy.
R. C. Anderson, T. G. Kollie, and C. A. Reeves, Jr. 30 Sep 81, 19p Y-2251
Contract W-7405-ENG-26

The structural use of alpha-extruded uranium-2.4 wt % niobium (U-2.4Nb) alloy rod was hampered by dimensional instability of the alloy. To develop an understanding of (and a solution to) the problem, the metastable state of the as-extruded and heat-treated alloy was studied with regard to its susceptibility to creep and cracking, its retention of residual stresses, and its dimensional stability. An annealing treatment of 600 exp 0 C for 30 minutes stabilized the structure and reduced residual stresses and improved dimensional stability. 12 figures, 2 tables. (ERA citation 06:035195)

ND-R-512(S) PC **A03**/MF **A01**
UKAEA, Springfields (England). Nuclear Power Development Labs.
Creep-Fatigue Behavior of Four Casts of Type 316 Stainless Steel.
J. Wareing. Jan 81, 30p
Work performed under United States-UKAEA Fast Reactor Exchange Program.
U.S. Sales Only.

Low-cycle fatigue tests including hold periods up to 24 h at maximum tensile strain have been conducted on four casts of Type 316 stainless steel in the temperature range 570 to 625 exp 0 C. These resulted in failure times up to 4000 h. In general fatigue life is reduced as the hold period increases, but the extent of life reduction varies from material to material and with test temperature. For two casts of material this initial life reduction is followed by an increase in life as hold periods are extended. The results are rationalized in terms of prevailing fracture processes, and the implication for the extrapolation of short-term data is discussed. (ERA citation 08:015824)

N82-14100/3 PC **A02**/MF **A01**
Technische Hochschule, Darmstadt (Germany, F.R.). Inst. fuer Werkstoffkunde.
Long-Term Stability of Finely Cast Alloys for Gas Turbine Blades under Hot Gas Corrosion Conditions Zeitstandfestigkeit von Feingusslegierungen fuer Gas Turbinenschaufeln.
K. H. Kloos, J. Granacher, and H. Denus. 1980, 25p DECHEMA-PROJ-4.2/1, DECHEMA-PROJ-4.2/1F
Text in German. Sponsored by Bundesministerium fuer Forschung und Technologie. Presented at European Symp. On the Interaction Between Corrosion and Mech. Stress at High Temp., Petten, Netherlands, 13-14 May 1980.

Two hot gas corrosion conditions were tested: mild for aircraft and industrial turbines, and hard (by adding seasalt or S, Na, Va and Cl) for aircraft and industrial gas turbine composite materials. The longest loading times obtained before rupture are about 2000 hr at 700C and about 5000 hr at 800C. The probes were microscopically investigated after the tests. No reduction of the long-term stability due to hot gas corrosion is found as compared to the case of air at rest.

N82-14351/2 PC **A02**/MF **A01**
Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V., Freiburg im Breisgau (Germany, F.R.). Inst. fuer Werkstoffmechanik.
Corrosion and High Temperature Resistant Coatings for Molybdenum, Made out of Iron and Nickel Alloys and Applied by Explosive Welding Korrosions- und Hochtemperaturbestaendige Schichten fuer Molybdaen Aus Fe- und Ni- Basislegierungen Aufgebracht Mittels Explosivplattierung.
R. Pruemmer, and R. Henne. Apr 80, 18p T-15/80
Text in German.

The impact parameters of the explosive welding of molybdenum with Inconel 601 were determined. The combination Mo and Inconel 601 was considered as nonweldable. It can be applied in solar radiation concentrating devices, allowing a higher operating temperature and higher energy conversion efficiency. The usual velocities of the explosive welding process (collision velocities of 2200 m/sec) lead at best to samples affected by cracks, due to the insufficient workability of molybdenum. At higher velocities cracks no longer occur, molybdenum being a strain rate sensitive material. Layer composite materials can be manufactured in flat as well as in tube form.

N82-14352/0 PC **A04**/MF **A01**
Battelle-Inst. e.V., Frankfurt am Main (Germany, F.R.).
Theoretical Investigations on the Separation of Immiscible Alloys.
Final Report.
D. Langbein. Feb 81, 66p BMFT-FB-W-81-004, BF-R-64-152-1
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The physical effects which contribute to the separation of immiscible alloys are discussed and mathematically modeled. Particular attention is given to (1) the mode of cooling, (2) the formation and growth of clusters, (3) free convection, (4) sedimentation, (5) capillary forces, (6) differences in surface tension, (7) differences in interface tension, (8) interface or Marangoni convection, (9) the directed growth of droplets, (10) Ostwald ripening, (11) the overlapping on the impoverished regions around droplets, and (12) the migration of droplets ahead of a solidification front. As it takes at least 20 sec for a metallic melt of 1 cm in diameter to cool down completely, all experiments planned or already conducted under zero-gravity have to be rated at this time interval. Effects (5) to (8) and (11) are fast processes in this sense, all being based on interface phenomena. The tendency of regions of equal concentration or temperature to contract into spheres is demonstrated using the transparent model system methanol/cyclohexane.

N82-14354/6 PC **A02**/MF **A01**
Societe Nationale Industrielle Aerospatiale, Suresnes (France). Lab. Central.
Fatigue Corrosion Resistance of Aluminum Alloys Tenue en Fatigue Corrosion de Quelques Alliages d'Aluminium.
E. Budillon, and D. Aliaga. 9 Jun 81, 17p SNIAS-812-551-104, C-42087
Text in French. Presented at 52ND AGARD Conf., Cesme, Turkey, 5-10 Apr. 1981.

Fatigue corrosion of light alloys used in aeronautical construction is evaluated. Alloys 2024, 2618, 2214, 6061, 7075, and 7050 are discussed. Dry argon, humid air, and salt water environments were used. Alloys 2618A and 7175 were subjected to additional analysis of crack behavior: with a surface coating; with chromium anode oxidation; and with a coating similar to those used by the aircraft industry. Salt water is the most harmful environment, followed by humid air. The 2000 series alloys are more affected than the 7000 series by these environments. In salt water; however, 2618A shows 25% greater resistance than 7175 to cracks. In normal, and humid air, chromium anode oxidation can adversely affect resistance. Shot blasting beforehand prevents this. In salt water, painting and anode treatment are effective in reducing environmental effects.

N82-14542/6 PC **A03**/MF **A01**
Institut de Soudure, Paris (France).
Fatigue Test Program on Notched Implanted Specimens, Cracked and Uncracked Programme d'Essais de Fatigue sur Implants Entailles, Fissures ou Non.
Final Report.

M. S. Debiez, and J. P. Doucet. Sep 80, 42p CETIM-12-Y-261, IS-10-882
Contract CETIM-4-77-5622
Text in French.

The influence of the geometry as well as of the presence of a cold crack on the fatigue behavior of zones subjected to thermal stresses was studied. The S-N curves do not show the expected differences for the variables tested, but rather indicate that crack geometry and presence are not determining factors with a notch of acute dimensions. The minimal endurance obtained for three types of steel (annealed E 36, E 620, and 25 CD 4) is 150 N/sq mm under cyclic traction. A fracture mechanical analysis was also performed. Results are only valid for uncracked notched specimens. Crack initiation and propagation phases are described and their coefficients are shown dependent on structure.

PB82-149121 Not available NTIS
National Bureau of Standards, Washington, DC.
The Titanium-Aluminum Phase Diagram: alpha/alpha(2) Phase Boundaries,
L. J. Swartzendruber, L. H. Bennet, L. K. Ives, and R. D. Shull. 1981, 9p
Contract N00014-72-F-0042
Pub. in Materials Science and Engineering 51, p1-9 1981.

Magnetic susceptibility measurements were used to determine the phase boundaries between the disordered hexagonal alpha and the ordered hexagonal alpha sub 2 phases in titanium-rich Ti-Al alloys.

PB82-152406 Not available NTIS
National Bureau of Standards, Washington, DC.
Binary Phase Diagrams of Transition Elements,
R. M. Waterstrat. Jun 81, 4p
Pub. in Bull. Alloy Phase Diagrams 2, n1 p35-38 Jun 81.

A brief explanation is given for an accompanying chart of binary phase diagrams of the transition elements together with references and a commentary on the source of each reference.

PB82-152448 Not available NTIS
National Bureau of Standards, Washington, DC.
Reflection X-Ray Topography Hardness Indentations in Copper Single Crystals,
K. C. Yoo, B. Roessler, R. W. Armstrong, and M. Kuriyama. 1981, 6p
Pub. in Scr. Met. 15, p1245-1250 1981.

The plastic deformation zones surrounding microhardness indentations put into the (110) surfaces of relatively soft copper and nickel single crystals have been studied by the asymmetrical crystal topography (ACT) method. The method gives valuable information about the importance of workhardening to determining the level of the microhardness pressure and to determining the magnitude of its anisotropy for different directions of the indenter axes for Knoop or diamond pyramid indentations. This is demonstrated especially for copper crystals by the very pronounced appearance of the strain patterns of diffraction contrast obtained at either type of hardness impression. Both the cumulative dislocation displacements (for extinction contrast) and their lattice rotations (for misorientation contrast) are employed in the analysis of the topographic strain patterns.

PB82-152679 Not available NTIS
National Bureau of Standards, Washington, DC.
Predicted Single-Crystal Elastic Constants of Stainless-Steel 316.
Final rept.,
H. M. Ledbetter. Nov 81, 2p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in British Jnl. of Non-Destructive Testing 23, n6 p286-287 Nov 81.

For stainless steel 316, the author gives an improved prediction of the three C sub ij elastic-stiffness constants, which determine the optimum direction for acoustic beams used to locate and size flaws. The predictive method applies to all cubic-crystal-structure anisotropic materials.

PB82-152687 Not available NTIS
National Bureau of Standards, Washington, DC.
Strength and Toughness of USSR Fe-20Cr-16Ni-6Mn-0.2N Weldments at Cryogenic Temperatures.
Final rept.,
K. A. Yushchenko, E. O. Paton, R. P. Reed, R. L. Tobler, and J. W. Elmer. 1980, 5p
Sponsored in part by National Science Foundation, Washington, DC. Div. of Materials Research.
Pub. in Proceedings of the International Cryogenic Engineering Conference (8th), Genova, Italy, June 3-6, 1980, p797-801.

The structural reinforcement of large superconducting magnets normally requires the use of a very strong tough alloy at liquid helium temperature. The base and weldment material of a Soviet austenitic stainless steel, a nitrogen-strengthened Fe-20Cr-16Ni-6Mn alloy, is evaluated and compared with conventional AISI 300 series stainless steels (Fe-18Cr-8Ni). Tensile and fracture toughness measurements were made on base, heat-affected zone and weld material. Both tungsten inert gas and submerged arc weld processes, using 20 mm thick plate, were used. Magnetic measurements were made after deformation and tensile flow strengths were compared with the temperature dependence of stable austenitic stainless steels to assess the occurrence and influence of martensitic phase transformations on low temperature properties. J-integral fracture toughness was measured and the base and weldment properties compared.

PB82-153297 Not available NTIS
National Bureau of Standards, Washington, DC.
Mechanisms for Transitional Friction and Wear Behavior of Sliding Metals,
Peter J. Blau. 1981, 12p
Sponsored in part by Office of Naval Research, Washington, DC., and National Science Foundation, Washington, DC.
Pub. in Wear 72, p55-66 1981.

Four processes which may cause transitions in the unlubricated sliding behavior of metals are described. These processes are (1) metal transfer, (2) film formation and removal, (3) debris generation and (4) cyclic surface deterioration.

PB82-153305 Not available NTIS
National Bureau of Standards, Washington, DC.
An Investigation of the Unlubricated Friction and Wear Break-In Behavior of a Dual-Phase Steel,
P. J. Blau. 1981, 14p
Sponsored in part by Office of Naval Research, Washington, DC.
Pub. in Wear 72, p67-80 1981.

The friction and wear break-in behavior of a dual-phase steel (steel DP 80) was investigated using a stroke-by-stroke fixed ball-on-flat tribometer. The standard rider balls were steel 52100 ball bearings slid at a load of 4.9 N and a velocity of 0.5 cm/s. The atmospheres used were air at a relative humidity of (58 plus or minus 3)% and flowing argon gas at a relative humidity of 30% - 35%. Surface finishes obtained by 1 micrometer diamond lapping and by dry abrasion with 600 grit SiC cloth were tested.

PB82-804063 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Titanium and Titanium Alloy Creep. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 232p
Supersedes PB80-815244, and NTIS/PS-79/0984.

Research is cited on creep of titanium and its alloys with regard to composition, stress corrosion, fatigue, fracture, and microstructure. Tests are described on varying conditions of temperatures, pressures, and atmospheres. Processing and metalworking are covered for their relationship to creep resistance. Many reports deal with applications to aircraft, spacecraft, and nuclear reactors. (This updated bibliography contains 224 citations, 18 of which are new entries to the previous edition.)

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A108 890/5 PC **A24**/MF **A01**
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
Laboratory Evaluation of Multiviscosity-Grade Engine Oils in U.S. Army Diesel Engines.
Interim rept. Nov 78-Jun 80,
Richard B. Moon, and Alan F. Montemayor. May 81, 567p Rept no. AFLRL-112
Contracts DAAK70-78-C-0001, DAAK70-80-C-0001

Seven multigrade engine oils were tested against 10 grade and 30 grade reference oil in the DD 6V-53T engine using a 240-hour tracked-vehicle cyclic endurance test and in the Teledyne Continental LD/LDT-465 engines using a 210-hour wheeled-vehicle cyclic endurance test. The results of these tests are tabulated and compared with results from reference oil tests. Two SAE 15W-40 oils proved equal or better than the reference oil and were recommended for adoption as MIL-L-2104 oils.

AD-A109 023/2 PC **A09**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Performance of Industrial-Type Engines in Military Equipment using Synthetic Crankcase Oils.
Final rept.,
Gene H. Austin, Thomas Bowen, Lewis Cheek, and Basil Zanedis. Jun 81, 187p Rept no. MERADCOM-2326

The investigation was to determine the possibility of eliminating crankcase oil changes in engines used in Military equipment. Based on the results, it appears that an extended oil change interval can be used which would result in significant savings. (Author)

PB82-152729 Not available NTIS
National Bureau of Standards, Washington, DC.
A Review of Antifriction Materials and Design for Cryogenic Environments,
R. L. Tobler. 1980, 12p
Sponsored in part by National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Pub. in Proceedings of Cryogenic Engineering Conference, Madison, Wisconsin, August 21-24, 1979, Paper A-5 in Advances in Cryogenic Engineering 26, p66-77 1980.

Friction must be considered in the design of any low temperature apparatus incorporating shafts, pistons, cams, gears, or other parts with sliding interfaces. Friction is usually more severe at cryogenic temperatures, causing problems of wear and heating. The latter factor is of special consequence to the design of superconducting devices since frictional heating would increase steady state cryogen consumption and operating costs, or possibly cause superconductors to go normal. This paper reviews the low temperature friction behavior of important structural materials and sliding couple combinations. Design methods and materials selection with regard to environment are discussed.

PB82-804048 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solid Lubricants. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 266p
Supersedes PB80-815665, and NTIS/PS-79/0853.

The Federally-funded research covers the preparation, applications, properties, and testing of solid lubricants. Molybdenum disulfide, polymer films, and graphite fluoride are but a few of the materials covered. (This updated bibliography contains 259 citations, 15 of which are new entries to the previous edition.)

11I. Plastics

AD-A108 782/4 PC **A03**/MF **A01**
Vermont Univ., Burlington. Dept. of Chemistry.
Organophosphazenes. 15. Reactions of Hexafluorocyclotriphosphazene with Tert- and n-Butyl Lithium Reagents.
Technical rept.,
Kolikkara Ramachandran, and Christopher W. Allen. 4 Dec 81, 26p Rept no. TR-10
Contract N00014-77-C-0605

The reactions of tert- and n-butyl lithium reagents with hexafluorocyclotriphosphazene (N3P3F6) have been examined. In contrast to the behavior of n-butyl lithium. The reaction of t-butyl lithium with N3P3F6 gives good

yields of N3P3F5C4H9. While the n-butyl lithium reaction follows a geminal pathway at the stage of disubstitution, the t-butyl lithium reaction gives exclusively the trans non-geminal isomer for the compounds N3P3F6-n (t-C4H9)n(n = 2,3). This is the first example of a regio and stereospecific reaction in phosphazene chemistry.

AD-A109 143/8 PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Chemical Engineering.
Morphology of the Polystyrene/Poly(Vinyl Methyl Ether) Blend as Studied by Excimer Fluorescence.
Final rept. 16 Oct 78-15 Oct 81,
Curtis W. Frank. 14 Dec 81, 7p ARO-15770.2-C
Contract DAAG29-78-C-0047

Excimer fluorescence is used to study conformational statistics and aggregation in miscible and immiscible blends of polystyrene with poly(vinyl methyl ether). At low polystyrene concentration in miscible blends, excimer fluorescence of isolated polystyrene chains is analyzed in terms of a one-dimensional random walk of the migrating singlet exciton. At high concentration in miscible blends the energy migration is three-dimensional. Knowledge of the fluorescence behavior for miscible blends is used to determine the phase composition for phase separated blends. (Author)

AD-A109 190/9 PC **A09**/MF **A01**
Case Western Reserve Univ., Cleveland, OH. Dept. of Macromolecular Science.
Improved Moisture Resistance of Fiber-Reinforced Plastic.
Final rept. 1 Jul 78-30 Sep 81,
Jack L. Koenig. Dec 81, 186p ARO-14740.4-MS
Contract DAAG29-80-C-0236, Grant DAAG29-78-G-0148

The text of seven papers is included: (1) Improved Moisture Resistance of Fiber-Reinforced Plastic (An Introduction); (2) The Structure of Aminofunctional Silane Coupling Agents: Part 1: gamma-Aminopropyltriethoxysilane and its Analogues; (3) Spectroscopic Characterization of the Matrix-Silane Coupling Agent Interface in Fiber-Reinforced Composites; (4) Interfacial Strength Studies of Fiber-Reinforced Composites; (5) Comparison of Primary and Secondary Aminosilane Coupling Agents in Anhydride-Cured Epoxy Fiberglass Composites; (6) Chemical Reactions Occurring at the Interface of Epoxy Matrix and Aminosilane Coupling Agents in Fiber-Reinforced Composites; (7) Magic-Angle Cross Polarization Carbon-13 NMR Study of Aminosilane Coupling Agents on Silica Surfaces.

AD-A109 237/8 Not available NTIS
SRI International, Menlo Park, CA.
Determination of the Impact Response of PMMA Using Combined Compression and Shear Loading,
Y. M. Gupta. 5 May 80, 11p ARO-15513.1-E
Contract DAAG29-78-C-0030
Availability: Pub. in Jnl. of Applied Physics, v51 n10 p5352-5361 Oct 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 281/6 PC **A05**/MF **A01**
General Electric Corporate Research and Development, Schanectady, NY.
Impact Response Characteristics of Polymeric Materials.
Final rept. 27 Apr 79-30 Apr 81,
William B. Hillig. Nov 81, 98p Rept no. SRD-81-081
Contract N00019-79-C-0347

This report describes the concluding work on a series of studies concerned with determining, understanding, and trying to predict the behavior of polymethylmethacrylate (PMMA) and polycarbonate (PC) under impact. In the present work the impact velocity was extended to 2.1, 125, and 220 m/s using a 4.5 mm steel ball as the projectile. Because of dispersion effects the pulse detected using an instrumented Hopkinson impact bar was markedly distorted. A new semi-empirical procedure for correcting the pulse was developed that overcame difficulties encountered in the theoretical methods. Analysis of the data showed that the deduced Young's modulus of PMMA slowly increases with increasing impact velocity. However, the derived modulus of PC decreases by a factor of five when the impact velocity was increased from 2.1 to 220 m/s. This decrease in stiffness is unexpected and anomalous, but is beneficial to reducing the potential for impact damage. A theoretically-based model was formulated to 'predict' the impact response of the two materials from their elastic modulus, densification properties, and stress-relaxation laws. This modified spring/dashpot model allows the response of the polymers to be continuously varied between series-like and parallel-like. The PMMA was found to require a predominantly series-like mode description, whereas the PC response was more parallel-like.

AD-A109 299/8 PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Mechanical Engineering.
Further Studies on Dynamic Crack Curving.
Technical rept.,
Y. -J. Sun, M. Ramulu, A. S. Kobayashi, and B. S.-J. Kang. Nov 81, 21p Rept no. TR-42
Contract N00014-76-C-0060

The elasto-dynamic stress field surrounding rapidly propagating cracks in thin polycarbonate, double edged crack tension specimens were analyzed by dynamic photoelasticity using a 16-spark gap Cranz-Schardin camera system. Crack curving was observed in two slanted double edged crack specimens and in two offset parallel double edged crack specimens. In another test, the crack ran straight between two symmetrically located twin cracks. Results of these five tests were used to verify the dynamic crack curving criterion by Ramulu, et al., in which a reference distance from the crack tip is incorporated into the maximum circumferential stress of minimum strain energy density criteria. The critical material property for crack curving in this thin polycarbonate sheet was found to be about ro = 0.5 mm.

AD-A109 360/8 PC **A03**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
The Structural Formation and Physical Behaviour of Cross-Linked Epoxy Resins,
M. Fisher, F. Lohse, and R. Schmid. Apr 81, 44p
RAE-LIBRARY TR-2067, DRIC-BR-81270
Trans. of Makromolekueare Chemie Die, (Switzerland) v181 p1251-1287 1980, by Barbara Crossland.

Network structures and physical properties of products obtained either by crosslinking polyepoxides with polyphenols, and by dicyandiamide or by catalytic polymerization are discussed and compared with those obtained by amine or anhydride curing. The highest crosslinking density is achieved by the polymerization of epoxy compounds. In polymerization, the glass transition temperature may rise by more than Delta T sub gv = 100 K. Amine and phenol curing result in similarly structured networks with mobile aliphatic segments and comparatively low crosslinking densities. Impact resistance based on dissipation of mechanical energy increases as network density decreases, a maximum being achieved with a medium chain length of 25-35 atom intervals between crosslinking points. The mechanical stability of polymers is limited by the cohesive strength KF. This latter corresponds to the maximum shear strength of bonds TKF sub max, which was measured within the temperature range of 77 K to 450 K, in accordance with the equation TKF sub max = KF = B - C . T; T < T sub g. This equation was derived from Eyring's model of viscosity, correlating B and C with activation volume, activation energy, T sug g and strain rate. B equals the cohesive strength at 0 K. It is determined by intermolecular forces but does not depend on the density of crosslinking. An increase of T sub g due to crosslinks or bulky segments causes a decrease of C and therefore a reduction of the temperature dependence of KF. Hence, cohesive strength at room temperature is improved. (Author)

AD-A109 385/5 PC **A03**/MF **A01**
Propellants, Explosives and Rocket Motor Establishment, Waltham Abbey (England).
The Weathering of Plastics Materials in the Tropics. 6. The Further Evaluation of a Solar Radiation Concentrating Device (EMMA) as a Means of Accelerating the Weathering of Plastics.
1981, 42p DRIC-BR-80352
Includes errata sheet dated 1981. See also Report 5 dated Jan 80, AD-A092 105.

This report is an account of a second trial conducted at Desert Sunshine Exposure Test Inc. using the facility of the EMMA and EMMAQUA machines which are reported to accelerate natural weathering. Low density polyethylene and polyacetal specimens were tested and no real acceleration factors could be found for the EMMA machines over natural 45 deg exposure. (Author)

AD-A109 402/8 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Chemical Engineering and Materials Science.
Equilibrium Modulus of Model Poly(Dimethylsiloxane) Networks,
M. Gottlieb, Christopher W. Macosko, Grant S. Benjamin, K. O. Meyers, and E. W. Merrill. 13 Nov 80, 9p ARO-16389.1-C
Contract DAAG29-79-C-0091
Availability: Pub. in Macromolecules, v14 p1039-1046 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 413/5 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Chemical Engineering and Materials Science.
Modulus of Three and Four Functional Poly(Dimethylsiloxane) Networks,
Christopher W. Macosko, and Grant S. Benjamin. 1981, 14p ARO-16389.2-C
Availability: Pub. in Pure and Applied Chemistry, v53 p1505-1518 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-862236 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Epoxy Resins: Aerospace Applications. 1973-February, 1982 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Feb 82.
Feb 82, 91p
Supersedes PB81-860553.

This bibliography covers the properties, behavior, and uses of epoxy resins in aerospace applications. Materials and objects containing epoxy resins are considered. Some attention is given to the testing of these materials and objects. (This updated bibliography contains 82 citations, 51 of which are new entries to the previous edition.)

PB82-862293 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Inorganic Polymers. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 72p
Supersedes PB81-858284.Prepared in cooperation with the Department of Energy, Washington, DC.

The formation and properties of inorganic polymers are discussed. Polymers based on tungstates, molybdates, and phosphates are featured and include formulations for ion exchange applications. Inorganic polymers with superconducting properties are included. (This updated bibliography contains 60 citations, 10 of which are new entries to the previous edition.)

11L. Wood and Paper Products

AD-A108 787/3 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Thermal Characteristics of Thick Red Oak Flakeboard.
Forest Service research paper,
Robert H. White, and E. L. Schaffer. Aug 81, 11p
Rept no. FSRP-FPL-407

As part of a cooperative project between Prudue University and the U.S. Forest Products Laboratory, 1-3/16-inch-thick red oak structural flakeboard was tested for fire penetration, flame spread, and thermal resistance. The small-scale testing indicated satisfactory thermal characteristics for a wood-based product. Fire penetration performance exceeded that of a 1-1/8-inch-thick plywood accepted as roof decking in heavy timber construction. Flame-spread performance met the class C criteria of 200 or less. Thermal resistance was consistent with suggested insulative design values for particleboard. (Author)

AD-A108 788/1 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.

Groundline Treatments of Southern Pine Posts.
Forest Service research paper,
Rodney C. DeGroot. Aug 81, 11p Rept no. FSRP-FPL-409

In 1957, 12 groundline treatments were applied to untreated green southern pine posts set in a field plot in the Harrison Experimental Forest of southern Mississippi. When supplemented with an effective cap treatment, groundline treatments substantially extended post life. The relative performance of groundline treatments to posts was strongly influenced by the formulation. Different formulations also provided different modes of protection to posts at the groundline. Push tests, used to monitor the posts, gave results that are useful in estimating likely performance of posts in agricultural and urban fences, but did not provide estimates of residual strength nor measure depths of protected wood prior to breakage at the groundline. (Author)

AD-A108 789/9 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Use of Oak in Linerboards.
Forest Service research paper,
D. W. Bormett, D. J. Fahey, and J. F. Laundrie. Aug 81, 11p Rept no. FSRP-FPL-410

In order to alleviate the increasing demand for softwoods, oak and pine pulps in varying ratios were investigated for linerboard use in corrugated containers. It was found that oak could be used in significant amounts in linerboard stock and, thus, provide an outlet for this currently underutilized species. Upon evaluating the combined boards and assembled containers it appeared that, when properly fabricated, at least 25 percent oak could be included and still satisfy today's required carrier rules. Considerably higher percentage of oak could be tolerated based on actual box performance despite somewhat lower combined board burst values. Scoreline fracturing for boards of any oak-pine ratio can be eliminated by proper adjustment of scorewheel clearance and board moisture content. (Author)

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A108 765/9 PC **A04**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
Acceleration of Convergence of a Vector Sequence by Reduced Rank Extrapolation.
Final rept. 1975-1980,
Robert P. Eddy. Nov 81, 60p Rept no. DTNSRDC-81/084

A new family of methods, called reduced rank extrapolation, is developed for accelerating convergence of the sequence of vectors generated during the iterative solution of a system of m linear algebraic equations in m unknowns. Large systems of this kind arise, for example, in the finite difference or finite element solution of partial differential equations. Reduced rank extrapolation is derived from full rank extrapolation, which is a straightforward generalization to vector space of the well known Aitken delta sq.-shanks e sub 1, scalar extrapolation. It is applicable when the iteration has reached a point where only a few, say r, eigenvalues dominate the situation and hence only r difference vectors can be linearly independent to specified tolerance. The rank, r, is determined during the solution of an auxiliary problem of best approximation in vector space, i.e., 'best' in the sense of minimizing some specified vector norm. Least squares theory, corresponding to the Euclidean norm, is developed in detail herein. Application to Laplace's equation in a square and in a cube yielded reduction in computation time by a factor ranging between 2.4 and 4.7, and reduction in iteration count by a factor ranging between 3.6 and 5.4. (Author)

AD-A108 781/6 PC **A02**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Asymptotic Normality of Autoregressive Parameter Estimates for Mixed Time Series.
Research rept. for period ending FY81,
D. F. Gingras. Sep 81, 16p Rept no. NOSC/TR-733

In this report it is shown for mixed time series, a series generated by an autoregressive moving-average (ARMA) process or by an autoregressive process observed in additive white noise (AR+N), that estimates of the autogressive (AR) parameters are asymptotically multivariate jointly normal with zero mean and finite covariance matrix. The structure of the asymptotic covariance matrix is evaluated for both types of mixed time series. (Author)

AD-A108 805/3 PC **A02**/MF **A01**
Sverdrup Technology, Inc., Arnold AFS, TN.
Accelerated Convergence of Structures Banded Systems Using Constrained Corrections.
Final rept. Oct 80-Aug 81,
Karl Kneile. Dec 81, 22p AEDC-TR-81-22

Descretization of fluid flow equations results in a structured banded system of equations. Interative methods used to solve such a system transfer information rapidly between neighboring points but exhibit slow global communication when the system is large. This phenomenon results in a slow convergence with the asymptotic stages showing a spatially smooth behavior for the errors, iterative corrections, and residuals. This smooth behavior is exploited by approximating the error and corrections with an interpolation over a selected subset of the grid. A variational form is used to compress the original system of equations into a smaller system. This compression is repeated through several levels of grid sizes to obtain a dramatic improvement in convergence rate. A relaxation parameter is dynamically calculated at each step with a negligible increase in computational effort. Although the method was developed for solving full potential flow using a variational principle, it is applicable to other problems with the structured banded property. (Author)

AD-A108 826/9 PC **A02**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
K-Connectivity in Random Undirected Graphs.
Technical rept.,
John H. Reif, and Paul G. Spirakis. 1981, 19p Rept no. TR-19-81
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

This paper concerns vertex connectivity in random graphs. We present results bounding the cardinality of the biggest k-block in random graphs of the G sub n,p model, for any constant value of k. These results generalize those of (Erdos, Renyi, 60) and (Karp, Tarjan, 80) for k = 1 and 2. We furthermore prove here that the cardinality of the biggest k-block is > or = n-logn with probability > or = 1/n-squared for p > or = c1(k)/n and c1(k) > k + 2. We also show that if p > or = c(k)(logn)/n with c(k) > 32 k-squared then the graph G sub n,p is k-connected with probability > or = 1-2n to the -d'(k) power, d'(k) > 1.

AD-A108 874/9 PC **A03**/MF **A01**
Educational Testing Service, Princeton, NJ.
Unbiased Estimators of Ability Parameters, of Their Variance, and of Their Parallel-Forms Reliability.
Research rept.,
Frederic M. Lord. Nov 81, 42p Rept no. ETS-RR-81-50
Contract N00014-80-C-0402

This paper is primarily concerned with determining the statistical bias in the maximum likelihood estimate theta-carat of the examinee ability parameter Theta in item response theory (IRT) (Lord, 1980); also of certain functions of such parameters. We will deal only with unidimensional tests composed of dichotomously scored items. We assume the item response function is three-parameter logistic. Available results for the sampling variance of theta-carat are currently limited to the case where the item parameters are known; the present derivations are limited to this case also. This limitation is tolerable in situations where the item parameters are predetermined, as in item banking and tailored testing. In the absence of a prior distribution for theta, it is well known that examinees with perfect scores have Theta-carat = Infinity; also that examinees who perform near or below the chance level on multiple-choice items may be given large negative values of theta-carat. This (correctly) suggests that theta-carat is positively biased for high-ability examinees and negatively biased for low-ability examinees. Will a correction of theta-carat for bias be helpful in such cases. The methods used to derive formulas for correction for bias are presented here.

AD-A108 875/6 PC **A03**/MF **A01**
Educational Testing Service, Princeton, NJ.
Standard Error of an Equating by Item Response Theory.
Research rept.,
Frederic M. Lord. Nov 81, 32p Rept no. ETS-RR-81-49
Contract N00014-80-C-0402

A formula is derived for the asymptotic standard error of a true-score equating by item response theory. The equating method is applicable when the two tests to be equated are administered to different groups along with an 'anchor test.' Numerical standard errors are shown for an actual equating (1) comparing the standard errors of IRT, linear, and equipercentile methods; (2) illustrating the effect of the length of the anchor test on the standard error of the equating. (Author)

AD-A108 882/2 PC **A03**/MF **A01**
Educational Testing Service, Princeton, NJ.
The Standard Error of Equipercentile Equating.
Research rept.,
Frederic M. Lord. Nov 81, 31p Rept no. ETS-RR-81-48
Contract N00014-80-C-0402

The standard error of an equipercentile equating is derived for four different situations. Some numerical results are checked by Monte Carlo methods. Numerical standard errors are computed for two sets of real data. (Author)

AD-A108 886/3 PC **A02**/MF **A01**
California Univ., San Diego, La Jolla. Inst. of Geophysics and Planetary Physics.
Hamiltonian Formulations for Surface Waves,
John W. Miles. 1981, 13p
Contract N00014-76-C-0025, Grant NSF-OCE77-24005
Pub. in Applied Scientific Research, v37 p103-110 Oct 81.

No abstract available.

AD-A108 888/9 PC **A05**/MF **A01**
University of Southern California, Los Angeles. Electronic Sciences Lab.
Synchronization Patterns and Related Problems in Combinatorial Analysis and Graph Theory.
Technical rept.,
Herbert Taylor. Jun 81, 100p Rept no. USCEE-509
Contract N00014-80-C-0745

Contents: Odd Path Sums in an Edge-Labeled Tree - A Problem due to John Leech; Counting induced Subgraphs; Choosability in Graphs; The M-pire Problem; Two Dimensional Synchronization Patterns for Minimum Ambiguity.

AD-A108 892/1 PC **A13**/MF **A01**
Naval Aerospace Medical Research Lab., Pensacola, FL.
Statistical Package User's Guide.
Special rept.,
Julie A. Hopson, and George A. Cotsonis. Aug 80, 299p Rept no. NAMRL-SR-80-3
Errata sheet inserted.

The Statistical Package User's Guide represents an aggregation of a variety of statistical analysis. The types of statistical programs available are: Analysis of Variance, Analysis of Covariance, Multivariate Analysis of Variance, Regression Analysis, Factor Analysis, Descriptive Statistics, and Nonparametric Statistics. The User's Guide provides the following documentation for each program: General Description, Mathematical Model, Operational Procedures, Test Data Statistical Analysis, and Software Coding. (Author)

AD-A109 017/4 PC **A02**/MF **A01**
Southern Illinois Univ. at Carbondale. Dept. of Mathematics.
Differential Approximation of Completely Monotonic Functions.
Technical rept.,
David W. Kammler. 10 Jun 80, 20p AFOSR-TR-81-0833
Grant AFOSR-74-2653
Pub. in SIAM Jnl. of Numerical Analysis, v18 n5 p900-918 Oct 81.

No abstract available.

AD-A109 032/3 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
Rotationally Symmetric Operators for Surface Interpolation.
Memorandum rept.,
Michael Brady, and Berthold K. P. Horn. Nov 81, 38p Rept no. AI-M-654
Contract N00014-80-C-0505

The use of rotationally symmetric operators in vision is reviewed and conditions for rotational symmetry are derived for linear and quadratic forms in the first and second partial directional derivatives of a function f(x, y). Surface interpolation is considered to be the process of computing the most conservative solution consistent with boundary conditions. The 'most conservative' solution is modelled using the calculus of variations to find the minimum function that satisfies a given performance index. To guarantee the existence of a minimum function. Grimson has recently suggested that the performance index should be a semi-norm. It is shown that all quadratic forms in the second partial derivatives of the surface satisfy this criterion. The seminorms that are, in addition, rotationally symmetric form a vector space whose basis is the square Laplacian and the quadratic variation. Whereas both seminorms give rise to the same Euler condition in the interior, the quadratic variation offers the tighter constraint at the boundary and is to be preferred for surface interpolation. (Author)

AD-A109 034/9 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Strong K-Connectivity in Digraphs and Random Digraphs.
Technical rept.,
John H. Reif, and Paul G. Spirakis. Oct 81, 31p Rept no. TR-25-81
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

This paper concerns an extension of the strong connectivity notion in directed graphs. A digraph D is k-strongly connected if, for each x,y vertices of D, there exist > or = k vertex disjoint paths from x to y and also > or = k vertex disjoint paths from y to x. A k-strong block of a digraph D is a maximal k-strongly connected subgraph of D. We show here how many results about the k-blocks in undirected graphs extend to k-strong blocks in digraphs. (Separation lemma, overlapping of k-strong blocks, number of them.) We prove, for example, that the maximum number of k-strong blocks for all k > or = 1 in any n-vertex graph is ((2n-1)/3). We also prove that two k-strong blocks cannot have more than k-1 vertices in common. We furthermore present results bounding the cardinality of the biggest k-strong block in random digraphs of the D(n,p) model. This work generalizes previous work on random undirected graphs.

AD-A109 035/6 PC **A04**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Probabilistic Analysis of Random Extension-Rotation Algorithms.
Technical rept.,
John H. Reif, and Paul G. Spirakis. Oct 81, 55p Rept no. TR-28-81
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

We introduce a new random structure generalizing matroids. The random independence systems (RIS) allow us to develop general techniques for solving hard combinatorial optimization problems with random inputs. We describe a randomized algorithm for efficiently constructing an independent set of fixed size in an instance of a random independence system. We provide a general method of analysis of the performance of this algorithm, which allows us to derive bounds on the mean, variance and all the moments of the time complexity of the algorithm. (Author)

AD-A109 046/3 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Random Independence Systems.
Technical rept.,
John H. Reif, and Paul G. Spirakis. Nov 81, 26p Rept no. TR-32-81
Contract N00014-80-C-0674, Grant NSF-MCS79-21024

This report introduces a new random structure generalizing matroids. These random independence systems allow us to develop general techniques for solving hard combinatorial optimization problems with random inputs.

AD-A109 055/4 PC **A02**/MF **A01**
California Univ., Berkeley. Operations Research Center.
Final Report on AFOSR-77-3179.
Rept. for 1 Feb 80-31 Jan 81,
Richard E. Barlow. 31 Jan 81, 9p AFOSR-TR-81-0846
Grant AFOSR-77-3179

Contents: Bayesian reliability; and Reliability growth.

AD-A109 112/3 PC **A07**/MF **A01**
Tennessee Univ., Knoxville. Dept. of Psychology.
Estimation of the Operating Characteristics When the Test Information of the Old Test Is Not Constant. II. Simple Sum Procedure of the Conditional P.D.F. Approach/Normal Approach Method Using Three Subtests of the Old Test, Number 2.
Research rept.,
Fumiko Samejima. Jul 81, 136p Rept no. RR-81-2
Contract N00014-77-C-0360
See also AD-A087 075. Continuation of Rept. no. RR-80-4.

This is a continuation of a previous study reported as RR-80-4, 'Estimation of the Operating Characteristics When the Test Information of the Old Test Is Not Constant II: Simple Sum Procedure of the Conditional P.D.F. Approach/Normal Approach Method Using Three Subtests of the Old Test'. In that study, a new method of estimating the operating characteristics of discrete item responses based upon an Old Test, which has a non-constant test information function, was tested upon each of two subtests of the original Old Test, Subtests 1 and 2. The results turned out to be quite successful. In the present study, Subtest 3, which contains as small a number of test items as fifteen, was used as the Old Test. Unlike the previous study, we have an additional challenge of handling negative and positive infinities of the maximum likelihood estimate obtained upon Subtest 3. (Author)

AD-A109 126/3 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Mathematics.
Final Scientific Report 1 July 1979-30 September 81,
Gerald D. Taylor. Sep 81, 3p AFOSR-TR-81-0808
Contract F49620-79-C-0124

This report lists articles written under support of the contract.

AD-A109 132/1 PC **A02**/MF **A01**
Princeton Univ., NJ. Dept. of Statistics.
Comparison of the Bioptimal Curve with Curves for Two Robust Estimates.
Technical rept.,
Katherine Bell Krystinik, and Stephan Morgenthaler. Oct 81, 12p TR-195-SER-2, ARO-16669.12-M
Contract DAAG29-79-C-0205

The performance of one-step biweights and Bob Bell estimates are compared with the performance of the bioptimal estimates. This is done for sample sizes 5, 10, and 20. The two situations are the Gaussian and slash. (Author)

AD-A109 166/9 PC **A02**/MF **A01**
California Univ., Berkeley. Electronics Research Lab.
Research on Multiparameter Stochastic Processes.
Final rept. 1 Sep 78-31 Aug 81,
E. Wong. 31 Aug 81, 5p ARO-15748.6-M
Grant DAAG29-78-G-0186

During the period of this grant, a number of problems on stochastic processes were studied. The principal achievements were: (1) The development of a theory of set-parametered martingales and an associated theory of stochastic integration. (2) The discovery of a class of nonlinear-filtering problems for which explicit solutions can be obtained. (Author)

AD-A109 187/5 PC **A05**/MF **A01**
Tennessee Univ., Knoxville. Dept. of Psychology.
How Small the Number of Test Items Can Be for the Basis of Estimating the Operating Characteristics of the Discrete Responses to Unknown Test Items.
Research rept.,
Fumiko Samejima, and Paul S. Changas. 16 Nov 81, 85p Rept no. RR-81-3
Contract N00014-77-C-0360

The methods and approaches for estimating the operating characteristics of the discrete item responses without assuming any mathematical form have been developed and expanded. It has been made possible that, even if the test information function of a given test is not constant for the interval of ability of our interest, we use it as our Old Test. Our original Old Test consists of thirty-five test items with three item score categories each. Recently, we experimented upon the Simple Sum Procedure of the Conditional P.D.F. Approach which is combined with the Normal Approach Method, using each of three subtests of the original Old Test, and the results turned out to be successful. In the present study, we experiment on the same combination of approach and method by using several subtests of the original Old Test, which contain fifteen or less test items each, to find out if each of them can still be used as the Old Test, which maintains the accuracy of estimation reasonably high. (Author)

AD-A109 199/0 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Statistics.
Bayesian Methods, Forecasting and Control in Statistics and Operations Analysis.
Final rept.,
G. E. P. Box, and G. C. Tiao. 5 Dec 81, 12p ARO-9909.3-M, ARO-12939.14-M, ARO-15734.12-M
Grants DA-ARO-D-31-124-72-G162, DAHC04-76-G-0010
Sponsored in part by Grants DAAG29-76-G-0304 and DAAG29-79-G-0166.

In this final report, a summary of main results is given for research in the following areas: (a) development of techniques for the analysis and decomposition of seasonal time series; (b) modeling and analysis of univariate and multiple time series; (c) robustness in statistical analysis; and (d) a unified theory of statistical inference and criticism.

AD-A109 247/7 Not available NTIS
Wisconsin Univ.-Madison. Mathematics Research Center.
The Landau Problem. II. The Case of Motions on Curves,
I. J. Schoenberg. 28 Sep 81, 13p ARO-16415.196-M
Contracts DAAG29-80-C-0041, DAAG29-75-C-0024
See also AD-A109 248.
Availability: Pub. in Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen, Series A v84 n3 p325-335 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 248/5 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
The Landau Problem. III. Motions on Special Curves and Time-Optimal Control Problems,
I. J. Schoenberg. 1981, 17p ARO-16415.197-M
Contracts DAAG29-80-C-0041, DAAG29-75-C-0024
See also AD-A109 247.
Availability: Pub. in Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen, Series A v84 n3 p337-351 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 283/2 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Statistics.

On a Locally Optimal Procedure Based on Ranks for Comparison of Treatments with a Control.
Mimeograph series,
Deng-Yuan Huang, and S. Panchapakesan. Jul 81, 10p Rept no. MMS-81-30
Contract N00014-75-C-0455

Let Phi sub 1,...,Phi sub k be independent populations representing k experimental treatments and let Phi sub O be the control treatment. Let f(x,Theta sub i denote the density of Phi sub i, i=O,1,...,k, satisfying certain regularity conditions. Any population Phi sub i is said to be superior to the control if Theta sub i > Theta sub O, and inferior otherwise. We assume that the value of Theta sub O is unknown but a good upper bound Theta sub O* is known. We are interested in selecting a subset (possibly empty) of the k experimental treatments consisting of the ones that are superior to the control. Though the functional form of f(x,Theta) is assumed to be known, we derive a procedure based on ranks in view of the usual considerations of robustness against possible deviations from the model. In deriving the rule, we control the error probabilities and maximize the ability to detect a superior population in a certain local sense. The rule is based on the ranks of the obvservations in a pooled sample of (k+1)n (n from each population) observations. In the special case of logistic density, this rule is expressed in terms of the rank-sum statistics. (Author)

AD-A109 288/1 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Statistics.
Isotonic Procedures for Selecting Populations Better than a Control Under Ordering Prior.
Mimeograph series,
Shanti S. Gupta, and Hwa-Ming Yang. Jul 81, 49p Rept no. MMS-81-24
Contract N00014-75-C-0455
Prepared in cooperation with Toledo Univ., OH. Supersedes AD-A103 891.

The problem of selecting a subset containing all populations better than a control under an ordering prior is considered. Three new selections procedures which satisfy a desirable basic requirement on the probability of a correct selection are proposed and studied. Two of the three procedures use the isotonic regression over the sample means of the k-treatments with respect to the given ordering prior. Tables of constants which are necessary to carry out the selection procedures with isotonic approach for the selection of unknown means of normal populations are given. The results including Monte Carlo studies indicate that, in general, the stepwise procedure delta sub 1, using isotonic estimators, is the best. (Author)

AD-A109 332/7 PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics.
Identification of Hereditary Control Systems via Approximation Techniques.
Final rept. 1 Jun 78-30 Sep 81,
John A. Burns, and Eugene M. Cliff. Nov 81, 8p ARO-15561.14-M
Contract DAAG29-80-C-0126, Grant DAAG29-78-G-0125

This report investigates approximation techniques for identification of control systems governed by functional differential equations. The work was primarily concerned with retarded systems, although some effort was devoted to neutral systems. Throughout the research, the objective was the development of efficient computational algorithms for parameter estimation in linear and nonlinear hereditary systems. The investigations were based on state space formulations of hereditary dynamics, on corresponding approximation techniques and on finite difference methods. The results obtained are applicable to a large class of dynamical processes with memory, including certain aeroelastic problems, biological feedback systems, feedback control systems, visco-elastic problems and mechanical systems with retardation.

AD-A109 362/4 PC **A03**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
An Examination of Stability Criteria for Iterative Numerical Schemes Used in Solving Differential Equations.
Technical rept.,
Katharine Moore. Jul 81, 35p RAE-TR-81081, DRIC-BR-81080

The stability of numerical schemes for solving algebraic finite-difference equations resulting from finite-difference approximations to differential equations is discussed. It is suggested that the von Neumann method together with its stability criterion provides a reasonably simple way of determining stability. However, there are limitations in its applicability, some of which are indicated. The method is tested in two examples and an indication is given of how best to treat first- and mixed-derivative terms occurring in differential equations. (Author)

AD-A109 370/7 PC **A02**/MF **A01**
Comptroller of the Army, Washington, DC.
Legitimate Techniques for Improving the R-Square and Related Statistics of a Multiple Regression Model,
Edwin J. Curle. 1981, 19p
Presented to the Annual Department of Defense Cost Analysis Symposium (16th).

Cost and analysts and DOD contractors frequently use regression analysis to develop cost estimating relationships, production relationships, and various forecasting equations. Invariably, those regression equations are presented in the text of the final report along with the statistical properties -- i.e. the R-Square, the Standard Error of the Estimate, the Durbin-Watson Statistic, etc. These statistics are often presented as evidence of the validity and accuracy of the resulting equation. The higher the R-square the bolder the print and the more prominently displayed. Unfortunately, high R-square's, favorable Durbin-Watson statistics, etc., can be artificially or inadvertently inflated to appear more favorable. In reality, the equation with good statistical properties may not reflect a valid causal relationship to explain variations in the dependent variable. In many cases the regression equations prove to be of little value in forecasting or explaining the relationships with new data. This paper discusses techniques for artificially raising the R-square and related statistical properties of regression equations. These techniques are presented for the benefit of analysts who are trying to improve the statistical properties of their equations and for the benefit of managers who must approve payment for such analysis. (Author)

AD-A109 376/4 Not available NTIS
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics.
A Difference Equation Approach to Parameter Estimation for Differential-Delay Equations,
J. A. Burns, and P. D. Hirsch. 1980, 32p ARO-15561.9-M
Grants DAAG29-78-G-0125, AFOSR-80-0068
Availability: Pub. in Applied Mathematics and Computation, v7 p281-311 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 421/8 Not available NTIS
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics.
The Cauchy Problem for Linear Functional Differential Equations,
Terry L. Herdman, Harlan W. Stech, and Samuel M. Rankin, III . 1981, 13p ARO-15561.5-M
Grant DAAG29-78-G-0125
Prepared in cooperation with West Virginia Univ., Morgantown.
Availability: Pub. in Integral and Functional Differential Equations, p139-149 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-152802 Not available NTIS
National Bureau of Standards, Washington, DC.
Dependence Concepts for Stochastic Processes.
Final rept.,
Dennis S. Friday. 1981, 13p
Pub. in Statistical Distributions in Scientific Work, p349-361 1981.

Dependence concepts are a relatively recent development in multivariate distribution theory. They allow dependence to be incorporated into a problem without requiring specific model assumptions, and define classes of multivariate distributions with useful properties. It is not apparent that related notions have also evolved in the theory and applications of stochastic processes. Multivariate concepts and stochastic process concepts, however, have had no influence on each other. In this paper, an overview is presented of the work in stochastic processes that is analogous to multivariate dependence concepts.

12B. Operations Research

AD-A108 823/6 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
Symmetric Complementation. Revision.
Technical rept.,
John H. Reif. 1981, 47p Rept no. TR-07-81-REV
Contract N00014-80-C-0647, Grant NSF-MCS79-21024

This paper introduces a class of 1 player games of perfect information, which we call complementing games; the player is allowed moves which complement the value of successive plays. A complementing game is symmetric if all noncomplement moves are reversible (i.e., form a symmetric relation). These games are naturally related to a class of machines we call symmetric complementing machines. Symmetric nondeterministic machines were studied in (Lewis and Papadimitriou, 801): they are identical to our symmetric complementing machines with complement moves allowed only on termination. (A companion paper to appear will describe the computational complexity of symmetric complementing and alternating machines.) Of particular interest is the complexity class Sum *CSYMLOG, which contains the outcome problem of symmetric complementing games with constant complement bound with game positions encoded in log space, and next move relations computable in log space. We show that the decision problem for a restricted quantified Boolean logic Sum *QBF sum is complete in Sum *CSYMLOG. We also show that Sum *CSYMLOG contains many well-known and common combinatorial problems: minimum spanning forests; k-connectivity and k-connected components, and also the recognition problems for many classes of graphs: planar graphs of valence 3; chordal graphs; comparability graphs; interval graphs; split graphs, and permutation graphs.

13.

MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A108 821/0 PC **A05**/MF **A01**
NUS Corp., Rockville, MD.
Kimborough Hospital Energy Audit.
Final rept.,
Robert W. Fell. Sep 81, 78p USAFESA-T-2106
Contract DACA31-80-D-0019

The results of an energy audit on Kimborough Hospital, Fort Meade, Maryland, are detailed herein. The report investigates various systems which consume energy in order to identify energy conservation opportunities. These selected systems include HVAC equipment, temperature and humidity controls, heat recovery equipment, building insulation, ventilation rate reduction, lighting systems and domestic hot water. The study analyzes energy conservation opportunities to determine which are cost effective and produce adequate energy savings. (Author)

AD-A109 022/4 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.

Energy Conservation in Navy Family Housing: A 'Master-Metered' Approach.
Technical rept. Jul-Oct 79,
Bela Feher, David F. Little, and E. P. Somer. Nov 81, 39p Rept no. NPRDC-TR-82-18
See also Rept. no. NPRDC-SR-79-23.

The purpose of the study was to develop, implement, and evaluate an intensive behavioral approach for inducing energy conservation in master-metered Navy family housing. A 200-unit housing complex was divided into equal-sized groups and treatment was randomly assigned to one group. Participants received energy-related materials and feedback regarding group energy consumption. An energy coordinator made household visits to participating residences. The participating group significantly reduced their electricity consumption to a level 4 percent below that of the control group. Energy-related attitudes, as measured by a questionnaire, were not found to be significant predictors of consumption. Consumption feedback and personal contact are seen as important supplements to traditional educational approaches to inducing behavioral change. (author)

DE81030968 PC **A06**/MF **A01**
San Bernardino Municipal Water Dept., CA.
Feasibility of Geothermal Heat Use in the San Bernardino Municipal Wastewater Treatment Plant. Final Report, September 1980-June 1981.
W. C. Racine, T. C. Larson, C. A. Stewart, and H. B. Wessel. 1981, 115p DOE/SF/11442-T2
Contract FG03-80SF11442

A system was developed for utilizing nearby low temperature geothermal energy to heat two high-rate primary anaerobic digesters at the San Bernardino Wastewater Treatment Plant. The geothermal fluid would replace the methane currently burned to fuel the digesters. A summary of the work accomplished on the feasibility study is presented. The design and operation of the facility are examined and potentially viable applications selected for additional study. Results of these investigations and system descriptions and equipment specifications for utilizing geothermal energy in the selected processes are presented. The economic analyses conducted on the six engineering design cases are discussed. The environmental setting of the project and an analysis of the environmental impacts that will result from construction and operation of the geothermal heating system are discussed. A Resource Development Plan describes the steps that the San Bernardino Municipal Water Department could follow in order to utilize the resource. A preliminary well program and rough cost estimates for the production and injection wells also are included. The Water Department is provided with a program and schedule for implementing a geothermal system to serve the wastewater treatment plant. Regulatory, financial, and legal issues that will impact the project are presented in the Appendix. An outline of a Public Awareness Program is included. (ERA citation 06:034663)

DE81032009 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Development of Advanced Building Materials for the Passive Solar Application.
J. J. Tomlinson. 1981, 5p CONF-810940-7
Contract W-7405-ENG-26
Annual contractors' review meeting on thermal and chemical storage, Tysons Corner, VA, USA, 16 Sep 1981.

A program to develop the concept of incorporation of phase change materials (PCMs) into conventional building materials has been initiated and consists of in-house analyses to characterize the thermal performance of a porous matrix suffused with a PCM, and concept experimental development through subcontracted efforts as the result of an RFP. The program is directed toward the development of material concepts which provide greater collection/storage efficiency and increased levels of thermal comfort in direct gain passive solar applications. (ERA citation 06:034581)

N82-14200/1 PC **A09**/MF **A01**
Dornier-Werke G.m.b.H., Friedrichshafen (Germany, F.R.).
Critical Analysis of Gradient and Isothermal Furnace Concepts for Use in Spacelab with Special Regard for Heat Pipe Technology and Connected Basic Requirements.
Final Report.
H. Lenski. Feb 81, 189p BMFT-FB-W-81-019, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The detailed design of the oven is presented. The maximum heater temperature is 2000 K for a heating power of 400 W. Gradients up to 150 K per cm are expected in a cylindrical copper sample of 10 mm diameter. Quenching of the samples during solidification by means of water evaporitive cooling is included. The utilization of a heat pipe furnace was discarded, since the Spacelab safety measures imposed by the usage of alkali metals in high temperature heat pipes were shown to offset its potential advantages with respect to conventional oven designs.

N82-14403/1 PC **A03**/MF **A01**
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Berlin (Germany, F.R.). Fritz-Haber-Inst.
Helium 2 Cooling Systems for Long Term Missions in Space: Phase Separation and Hybrid Cooling Systems Helium-2-Kuehlsysteme MIT Langen Standzeiten fuer Weltraumanwendungen: Phasentrennung, Hybrid-Kuehlsysteme.
G. Klipping, I. Klipping, and 10 Sep 80, 50p
Text in German. Report Will Also Be Announced as Translation (Esa-TT-721).

The suitability of helium 2 (superfluid helium) phase separation and hybrid cooling systems for astronomical and aeronomical observations in space, e.g., infrared radiation, was studied. The different aspects of phase separation under conditions of weightlessness are treated and the active phase separator for a liquid helium cooled infrared observatory for Spacelab, German Infrared Laboratory (GIRL) is described. For long-term (more than one year) applications, a hybrid cooling system is required in which refrigerants boiling at higher temperatures are employed. The suitability of hydrogen and neon were investigated as well as that of a secondary solid refrigerant. Analysis indicates that such a hybrid cooling system, using solid neon, can be realized and has substantial advantages compared with a one-stage He 2 cooling system.

N82-14405/6 PC **A05**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. for Refrigerating Engineering and Air Conditioning.
Simulation of Transient Behavior of a Compression-Evaporation Refrigeration System.
H. Yasuda, C. H. M. Machielsen, S. Touber, S. W. Brok, and M. Debruijn. Mar 81, 97p WTHD-133

A mathematical model was developed, which by timewise integration of the governing equations pertaining to each of the components, permits computer simulation of steady state as well as transient behavior of single stage vapor compression systems, as used in refrigeration, air conditioning, and heat pumps. Qualitative (stable behavior, or not) and quantitative conclusions (amplitudes, frequencies) are obtained. Comparison with experimental results for dynamic behavior validates the model. The computer programs are appended.

N82-14552/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Reliable Aerial Thermography for Energy Conservation.
Final Report.
J. R. Jack, and R. L. Bowman. Aug 81, 35p NASA-TM-81766, DOE/NASA/20270-1
Contract DE-AI01-79CS-20270
Original Contains Color Illustrations.

A method for energy conservation, the aerial thermography survey, is discussed. It locates sources of energy losses and wasteful energy management practices. An operational map is presented for clear sky conditions. The map outlines the key environmental conditions conductive to obtaining reliable aerial thermography. The map is developed from defined visual and heat loss discrimination criteria which are quantized based on flat roof heat transfer calculations.

N82-14632/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Design of an Energy Conservation Building.
R. N. Jensen. Nov 81, 32p NASA-TM-83175

The concepts in designing and predicting energy consumption in a low energy use building are summarized. The building will use less than 30,000 Btu/sq.ft./yr. of boarder energy. The building's primary energy conservation features include heavy concrete walls with external insulation, a highly insulated ceiling, and large amounts of glass for natural lighting. A solar collector air system is integrated into the south wall. Calculations for energy conservation features were performed using NASA's NECAP Energy Program.

PB82-144106 Not available NTIS
National Bureau of Standards, Washington, DC.
Simulation of Thermal Performance of Solar Collector Arrays.
Final rept.,
A. H. Fanney, and W. C. Thomas. Aug 81, 10p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Trans. ASME 103, p258-267 Aug 81.

An experimental method is described for simulating the useful energy supplied by collector arrays during tests of solar water heating systems. The method uses an electric heat source to simulate the absorbed solar energy in series with nonirradiated collectors to simulate the concurrent heat losses. This configuration maintains the collector-loop flow characteristics which are important for system tests. Expressions are developed for programming the heat source for collector arrays connected in parallel and series combinations with the heat source located either upstream or downstream from the nonirradiated array. Thermal modelling of representative arrays is used to investigate the consequences of using linearized collector efficiency curves to program the heat source and of using nonirradiated collectors to simulate heat losses.

PB82-145392 PC **A07**/MF **A01**
P/S Energy Services, Inc., Roseville, MN.
Energy Accounting Procedures Manual for Local Governments and School Districts.
Jan 81, 139p MEA-12-81

This is an energy workbook with forms designed to help schools and communities in analyzing their energy use, costs, and setting up an accounting system. It also provides help for ranking energy conservation measures. Many sections are made to be pulled and given to the departments or persons covering each area. The manual covers energy use in buildings, processes such as water pumping and wastewater treatment, street lighting, and motored vehicles. The manual has separate chapters for each of these with record keeping forms provided, basic energy conservation information, explanations on how to use the energy information in energy budgeting and energy decisions, and descriptions of common ways to analyze energy information, such as Btu/square foot/year.

PB82-152505 Not available NTIS
National Bureau of Standards, Washington, DC.
Maximum Practical Efficiency of Helium Temperature Refrigerators.
Final rept.,
R. O. Voth. Nov 81, 6p
Pub. in Cryogenics 21, n11 p635-640 Nov 81.

An ideal refrigerator, using a perfect gas working fluid, is defined which gives the efficiency of a refrigerator as a function of compressor and expander efficiency, heat exchanger temperature difference, and heat exchanger pressure drop. Although not suited to detailed hardware design, this approach clearly relates the overall cycle efficiency to component efficiencies. In contrast, computer studies of specific cycles using real fluid properties are usually such that the details tend to overshadow major trends. The results of the study show that in an efficient cycle, the major losses are in the compressor and the cold end expansion device. For current compressor and expander efficiencies, the maximum practical helium temperature refrigerator efficiency is about 37% of Carnot.

PB82-152588 Not available NTIS
National Bureau of Standards, Washington, DC.
Estimating Residential Seasonal Cooling Requirements,
Walter H. Parken, and George E. Kelly. 1981, 18p
Pub. in Proceedings of ASHRAE 1981 Semiannual Meeting, Chicago, Illinois, January 25-29, 1981, ASHRAE Transactions 87, Pt. 1, p473-490 1981.

A method is presented (referred to as the modified building load and temperature bin method, MBLTBM) for calculating residential building cooling loads and

seasonal cooling requirements for varius geographical regions. The method incorporates the effects of solar radiation, internal heat gains, outdoor temperature, infiltration, and thermal response on the cooling load for different periods of the day. The MBLTBM can be used with improved precision over existing simple calculation procedures without the use of large, sophisticated and time consuming computer programs. The increased precision in determining seasonal cooling requirements can result in improved estimates of the cost of operating air conditioning equipment. The method requires little additional data to what are presently required for calculating design cooling requirements. For the region of interest, temperature bin data (the number of hours during the cooling season the temperature, in 5 degree F (2.8 degree C) increments, occurs), the summer daily average temperature, and the average daily extreme temperatures are required and readily obtainable. Also needed for the calculation procedure are the solar heat gain factors for windows and incident solar radiation on vertical and horizontal opaque surfaces.

PB82-154303 Not available NTIS
National Bureau of Standards, Washington, DC.
Standards Criteria for HVAC Systems and Equipment Performance Simulation Procedures.
Final rept.,
Tamami Kusuda. Oct 81, 4p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in American Society of Heating, Refrigeration and Air-Conditioning Engineers Jnl. 23, p25-28 Oct 81.

Systems simulations have been considered an essential part of the building energy calculations used for regulations such as the Building Energy Performance Standards. Regardless of whether or not the BEPS survive political changes with the current administration, these are still critical ingredients for HVAC equipment analysis and accurate energy calculations.

PB82-160516 PC **A07**/MF **A01**
Wirtschaft und Infrastruktur G.m.b.H. und Co. Planungs-KG, Munich (Germany, F.R.).
Study on an Example of Heat Supply from Waste Heat,
Gerhard Ebert, and Heinz W. Simoneit. Dec 79, 128p
BMFT-FB-T-79-118
Trans. of mono. Untersuchung Eines Modells der Waermeversorgung aus Absaerme, Munich, 173p Dec 79. See also German version PB81-104879.

This study was prepared with the objective of presenting a guideline of the possibilities of waste heat utilization with the help of a specific problem. The first part deals with the general fundamentals of waste heat use. The topic is confined to the employment of smaller and medium waste heat sources with locations isolated from grid systems. These waste heat sources represent the major portion of the hitherto neglected waste heat potential. It is especially the isolated location which in many cases proved to be an obstacle to utilization. The subject of the study is only utilization without employment of heat pumps, because heat pumps as a rule require additional investment and operating costs. The second part deals with a specific problem. Using the example of the special refuse disposal facility in Ebenhausen, it is shown under what conditions a supply of waste heat from this waste heat source can be used economically for the heat supply of the community. On the basis of the supply and need situation in Ebenhausen, a technical design and economic analysis of a waste heat utilization model is presented.

PB82-861634 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solar Space and Water Heating Systems: Multifamily Buildings. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 213p
Prepared in cooperation with the Department of Energy, Washington, DC.

Reports are cited which discuss design innovations and performance evaluations of solar space heating and solar water heating systems for multifamily complexes. Among the multifamily structures examined are condominium complexes, apartment buildings, apartment buildings converted to condominium units, cooperatives and multifamily housing structures for the elderly. Retrofit and new installation systems, solar assisted and totally solar heated systems, and active and passive solar heating systems are included with reference to design, installation advantages and disadvantages, and performance evaluations of numerous existing systems at various worldwide geographical locations. State and federal funding programs are also examined for domestic installations. (Contains 214 citations fully indexed and includes a title list.)

PB82-861642 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Multifamily Housing Energy Consumption and Conservation. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 194p
Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography cites reports concerned with residential multifamily housing energy consumption. Rowhouses, apartment buildings, condominiums, apartment conversions to condominiums, and multifamily housing units for the elderly are among the mass housing complexes examined with reference to energy management systems for space heating and cooling, water heating, refrigeration, and general electrical power sources. Energy consumption monitoring by master metered apartment and condominium structures, energy conservation factors in real estate appraising, economic savings in mass housing when all occupants are encouraged to conserve, life-style and energy consumption programs, energy performance standards for newly constructed multifamily structures, and mass housing energy conservation programs are included. (Contains 177 citations fully indexed and includes a title list.)

13B. Civil Engineering

AD-A108 768/3 PC **A03**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Proposed Test Plan for Studying the Impact of Construction Noise on Neighboring Communities.
Final rept.,
Steven D. Hottman. Sep 81, 32p Rept no. CERL-TR-N-115
Contract EPA-IAG-80-D-X0969

This report presents a detailed test plan for studying the impact of noise from construction activities on neighboring communities. The plan details the physical noise-measurement protocol, site selection plans, attitudinal questionnaires for residential and nonresidential areas, respondent sampling plans, and equipment and personnel needs.

AD-A108 802/0 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Geotechnical Lab.
Precast Concrete Pavements.
Final rept. Nov 78-Sep 80,
Raymond S. Rollings, and Yu T. Chou. Nov 81, 66p
Rept no. WES/MP/GL-81-10

This report reviewed published literature on precast concrete pavements and found that precast concrete pavements have had some limited application in airfields, roads, and storage areas. This review of past experience and an analytical study of precast slabs concluded that existing design and construction techniques can be adapted for use with precast concrete pavements, but more work is needed to develop effective and easily constructed load transfer designs for slab joints. Precast concrete does not offer any advantage for conventional pavements due to its high cost and surface roughness, but it may find applications for special problems such as construction in adverse weather, subgrade settlement, temporary pavements that need to be relocated, and military operations. (Author)

AD-A108 804/6 PC **A05**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Evaluation of Lands for Off-Road Recreational Four-Wheel Drive Vehicle Use.
Final rept.,
Robert M. Lacey, and W. D. Severinghaus. Oct 81, 86p Rept no. CERL-TR-N-110

This report describes a method to evaluate land areas on Army installations for use by off-road recreational four-wheel drive (4WD) vehicles. The method describes how to identify incompatible land uses and noise conflict, choose candidate areas, evaluate soil and biological suitability, and develop trails. Also discussed are 4WD user participation, trail design, vehicle operating conditions, and environmental assessment and monitoring. The information in this report focuses on the purely recreational use of 4WD vehicles. The evaluation method is designed to be as nontechnical as possible, so Army personnel normally charged with installation land management can perform the evaluation. The method can also be used for many public and private applications. (Author)

AD-A108 852/5 PC **A14**/MF **A01**
Shapiro and Associates, Inc., Seattle, WA.
Duwamish Waterways Navigation Improvement Study: Review of Existing Information on Land-Use Plans and Aquatic Resources in and Adjacent to the Duwamish River and Elliott Bay, Washington.
Final rept.
Jun 80, 317p
Contract DACW67-78-C-0122
Prepared in cooperation with Parametrix, Inc., Dan Cheney, Waltham, MA.

As part of the study on the Duwamish River Navigation Improvement Project, this literature search was performed to compile and review all existing information and ongoing research on lands and natural resources that may be affected during the widening and deepening of the Duwamish Waterway. The area of interest included Seattle Harbor, Elliott Bay, the Duwamish River and Waterway, and the Duwamish-Green River system to Howard A. Hanson Dam. Major information topics covered in the literature search include land use and development plans in the Lower Duwamish River and Seattle Harbor and water quality and aquatic resources upstream to Howard A. Hanson Dam. Coordination with Federal, state and local government agencies allowed access to existing libraries and bibliographies on the study area. Unpublished information on file was accessed when available and current research activities were surveyed. City, University, and consultants' libraries were other major sources of literature. (Author)

AD-A108 891/3 PC **A20**/MF **A01**
Corps of Engineers, Seattle, WA. Seattle District.
State of Washington Aquatic Plant Management Program.
Final environmental impact statement.
Oct 79, 462p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

A program for the management of the nonnative aquatic plant Eurasian watermilfoil (Myriophyllum spicatum L.) is proposed for waters within the State of Washington. The proposed program is designed to prevent the spread of milfoil to uninfested navigable waters and to control existing milfoil growth at high-use public areas in navigable waters. Monitoring of any proposed chemical treatment methods utilized and evaluation of the overall effectiveness of the Aquatic Plant Management Program are incorporated as project features. Treatment methods which are acceptable for use in prevention and control operations are: (1) Prevention - Rotovating, hand removal, suction dredging, fragment barriers, or the herbicide 2,4-D. (Aerial surveillance, ground surveillance, and public information will also be utilized by the prevention program); and (2) Control - Mechanical harvesting, fiberglass bottom screens, 2,4-d, endothall, diquat, or dichlobenil. The methods or combination of methods that may be utilized are specific to each site proposed for treatment and would be determined by the local sponsor. (Author)

AD-A108 895/4 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Hydraulics Lab.
Evaluation of In-Reservoir Cofferdam on Richard B. Russell Reservoir and Hydropower Releases. Hybrid Model Investigation.
Final rept. Jan 78-Jan 80,

Dennis R. Smith, Jeffrey P. Holland, Bruce Loftis, and Charles H. Tate, Jr. Oct 81, 60p Rept no. WES/TR/HL-81-12

The U. S. Army Corps of Engineers, Savannah District, will install an innovative oxygen injection system in the proposed Richard B. Russell Reservoir to enhance the dissolved oxygen distribution in the reservoir and in the release. To complement this effort, a hybrid modeling study was conducted to evaluate the compatibility of various in-reservoir geometries with the injection scheme. The relative impact of four in-reservoir geometries upon the in situ and release water quality was investigated. Additionally, idealized calculations were made to determine the respective injection rates required to maintain a release dissolved oxygen concentration of 6 mg/l (or more). (Author)

AD-A108 902/8 PC **A04**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Blue Mountain Lake Dam (NDI ID PA 00627, PA DER 45-34), Delaware River Basin, Unnamed Tributary of Brodhead Creek, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 54p
Contract DACW31-81-C-0016

Blue Mountain Lake Dam is an earth embankment dam, approximately 540 feet long with a maximum height of about seven feet. The maximum storage capacity of 104 acre-feet at the low point of the top of the dam and the maximum height of seven feet place the dam in the 'Small' size category. One permanent residence is located about 2,800 feet downstream of the dam and about five feet above the streambed. Because of the probability of appreciable property damage to the one house and the possibility of the loss of a few lives in the event of a dam failure, the dam is classified as having a 'Significant' hazard potential. The spillway is not capable of passing the 100 year flood without the embankment being overtopped; therefore, the spillway is classified as 'Inadequate'.

AD-A108 903/6 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Bigan Dam (NDI ID Number PA-237, DER ID Number 56-94), Ohio River Basin, Sandy Run, Somerset County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 71p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Bigan Dam appears to be in poor condition and modifications to the dam have apparently been in progress for several years. The reservoir pool is maintained at a reduced level due to a directive from the Commonwealth pending the completion of design modifications to the structure. Due to the questionable condition of the earthen embankment section near the right abutment, the static stability of the structure is questionable. The spillway for the dam is a temporary structure, and a new spillway is planned at the dam. The owner should be urged to complete the construction of the facility as soon as possible. The completion of the structure should include an assessment of the earthen embankment section near the right abutment, and the stability of the section should be evaluated.

AD-A108 904/4 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Derry Rod and Gun Club Dam (NDI ID Number PA-518, DER ID Number 65-143), Ohio River Basin, Miller Run, Westmoreland County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 74p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The Dam appears to be in fair condition, with the condition of the operating facilities being considered as poor. The maintenance of the dam and operating facilities is considered poor. The condition of the principal spillway discharge line is in a visibly deteriorating condition at the outlet. A wet area was observed on the downstream slope of the dam. The condition of the wet area did not appear to pose an immediate problem relative to the stability of the structure. Groundwater and surface runoff near the right abutment has caused erosion gullies along the toe of the dam, adjacent to the right abutment contact. The erosion could potentially erode the toe of the dam, and the runoff should be diverted away from the toe of the dam. A low spot was noted during the inspection, and the top of dam should be filled to an elevation consistent with the top of slope at the emergency spillway at the left abutment. The drainline valve has not been operated in several years. The control stem for the valve reportedly is located in the reservoir, but the stem was not visible during the inspection period.

AD-A108 909/3 PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Chena River Lakes Project Revegetation Study. Three-Year Summary,
Lawrence A. Johnson, Susan D. Rindge, and David A. Gaskin. Oct 81, 70p Rept no. CRREL-81-18

During the growing seasons of 1977, 1978, and 1979, revegetation techniques were studied on the Chena River Lakes Project, a flood control dam and levee near Fairbanks, Alaska, to find an optimal treatment for establishing permanent vegetation cover on the gravel structures. The treatments tested on plots at the dam and/or levee involved three main variables: (1) vegetation (grass and clover seed and/or willow cuttings), (2) mulch, mulch blanket, and/or sludge, and (3) substrate (gravel or fine-grained soil over the gravel base). The mulches were hay, wood-cellulose-fiber, peat moss, and Conwed Hydro Mulch 2000, which is a wood-cellulose-fiber mulch with a polysaccharide tackifier. A constant rate of fertilizer was applied to all plots except the control. A section of each plot was refertilized again in their third growing season to compare annual and biannual fertilization. The high fertilization rate produced above-average growth. Fescue, brome, and foxtail were the most productive species on the dam, while alsike cover was the most productive on the wetter levee site. When grass seed and willow cuttings were planted at the same time, willow survival and growth were reduced. Fertilization is required for at least two years to produce an acceptable permanent vegetation cover, although fine-grained soil or sludge reduces the amount of fertilizer needed in the second year. Third-year fertilization may not be necessary since the benefits of the second fertilization continue for at least two years. A sludge treatment refertilized during its second growing season produces the highest biomass recorded in this study.

AD-A108 915/0 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
The Value of Radar Observations on the Question of Stratospheric Turbulence Transport,
Edmond M. Dewan. 1981, 8p Rept no. AFGL-TR-81-0345
Pub. from Conference on 20th Radar Meteorology, p122-128 30 Nov-3 Dec 81.

No abstract available.

AD-A108 945/7 PC **A04**/MF **A01**
D'Appolonia Consulting Engineers, Inc., Pittsburgh, PA.
National Dam Inspection Program. Bel-Air Lake Dam (NDI I.D. PA-0066, DER I.D. 058-116), Susquehanna River Basin, Tributary of Snake Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Aug 81, 70p
Contract DACW31-81-C-0014
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The condition of Bel-Air Lake Dam is considered to be unsafe/nonemergency due to a seriously inadequate spillway capacity. The overall condition of the dam is considered to be fair. Although at this time no signs of significant distress were observed, it appears that the center of the dam has significantly settled. The design drawings show the design freeboard to be five feet, but the available freeboard is only approximately two feet. It also appears that fill has been placed on the downstream slope, increasing the crest width from the design value of 10 feet to about 30 feet near the center line of the dam and greater than 50 feet near the left abutment. The dam has no functional low level outlet facility.

AD-A108 946/5 PC **A04**/MF **A01**
D'Appolonia Consulting Engineers, Inc., Pittsburgh, PA.
National Dam Inspection Program. Buzzard Swamp Waterfowl Area Number 6 Dam (NDI I.D. PA-1007, DER I.D. 24-51), Ohio River Basin, Muddy Fork, Elk County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Aug 81, 70p
Contract DACW31-81-C-0014
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the visual inspection and the evaluation of available information, the Buzzard Swamp Waterfowl Area No. 6 Dam is considered to be in good condition. At the time of inspection, no conditions were observed that would adversely affect the overall performance of the structure. The analysis showed that the spillway was capable of accommodating the upper limit of the spillway design flood, 50 percent of the PMF. Therefore, the spillway capacity is considered to be adequate. The following actions are recommended for implementation as soon as possible or on a continuing basis: (1) Around-the-clock surveillance should be provided during unusually heavy rainfall and/or runoff. In addition, a formal warning system should be devised to provide for alerting downstream residents in the event of an emergency; (2) The dam and appurtenant structures should be inspected regularly and necessary maintenance should be performed on a regular basis.

AD-A108 947/3 PC **A04**/MF **A01**
D'Appolonia Consulting Engineers, Inc., Pittsburgh, PA.
National Dam Inspection Program. Colver Dam (NDI I.D. PA-0437, DER I.D. 11-20), Ohio River Basin, North Branch Blacklick Creek, Cambria County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Aug 81, 57p
Contract DACW31-81-C-0014
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The dam is classified as a small dam in the significant hazard category. In view of the size of the dam which is closer to the lower limit of the small size classification, the 100-year flood was selected as the spillway design flood. The 100-year flood peak was determined according to the recommended procedure and was found to be in excess of the spillway capacity. Therefore, the capacity of the spillway is classified as inadequate. The following recommendations should be implemented immediately on continuing basis: (1) The owner should determine the nature and extent of modifications needed and implement these measures to provide adequate spillway capacity; (2) Around-the-clock surveillance should be provided during unusally heavy rainfall and/or runoff. In addition, a formal warning system should be developed to alert downstream residents in the event of an emergency; and (3) The owner should develop and follow a formal operating and maintenance plan and should inspect the dam regularly.

AD-A108 948/1 PC **A04**/MF **A01**
D'Appolonia Consulting Engineers, Inc., Pittsburgh, PA.
National Dam Inspection Program. Ross Pond Dam (NDI I.D. PA-0265, DER I.D. 058-142), Susquehanna River Basin, Tributary of Drinker Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Aug 81, 55p
Contract DACW31-81-C-0014
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The condition of Ross Pond Dam is considered to be fair. Although at this time no major sign of distress was noted, concerns exist as to the structural adequacy of the dam. As reported by the owner, the embankment material was placed by scrapers in lifts. It appears that no compaction was performed other than rolling of the material by scrapers. It also appears that no laboratory testing, engineering analysis and evaluation, or further testing were performed to assess the adequacy of the fill material for use in an impounding structure. Some surficial sloughs were observed along the downstream slope. Seepage areas were found below the toe of the dam near the left abutment. Flow through the low level outlet pipe is reportedly controlled by an upstream valve submerged in the reservoir. Because the valve is not accessible and its operational condition is uncertain, the dam is not considered to have adequate emergency drawdown facilities.

AD-A108 949/9 PC **A05**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Caledonia Water Company Dam (NDI I.D. PA-1143, DER I.D. 28-108), Potomac River Basin, Stump Run, Franklin County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 78p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The Dam appears to be in fair condition but poorly maintained. Surface erosion has caused silt and sand to be deposited at the toe of the dam, in the area of the drainline outlet. The outlet was not visible during the inspection. Soil erosion deposits have been allowed to continue unchecked and have apparently covered the outlet. No determination could be made with regards to the condition of the drainline and outlet. A seepage area was observed at the downstream toe of the dam near mid-embankment. Seepage at the location was estimated to equal 1 gallon per minute. The cause of the seepage should be investigated, and its potential affect on the long term stability of the structure determined. Final construction of proposed modifications may not have been completed. No drainline control facility exists to regulate flow through the drainline, and final seeding of the embankment crest and slopes were either unsuccessful or never completed. Observed obstructions at the entrance to, and in, the principal spillway channel, were noted as having a potential effect on the discharge capacity of the spillway.

AD-A108 950/7 PC **A05**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Marguerite Dam (NDI ID Number PA-455, DER ID Number 65-16), Ohio River Basin, Branch Sewickley Creek, Westmoreland County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 76p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Marguerite Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. Marguerite Dam appears to be in fair condition and poorly maintained. The stability of the structure is questionable due to the steep downstream slope and the existance of seepage on the downstream slope adjacent to the right spillway wall (left abutment). The masonry wall located along the upstream face of the dam is collapsing in sections and falling into the reservoir. Cracking of the masonry wall at the right of the approach to the spillway is occurring, and should be repaired. Brush and small trees have been allowed to grow unchecked along the entire downstream slope of the dam. The entire area along the downstream toe of the dam is wet, and ponding is occuring in the area of the valve pit at the downstream toe. Positive drainage for the ponding should be provided. Seepage noted during the inspection was measured to range from 10 to 15 gallons per minute. The drainline valve is located at the downstream toe of the dam which is considered a deficiency.

AD-A108 951/5 PC **A05**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Bigby Run Dam (NDI ID Number PA-226, DER ID Number 56-21), Ohio River Basin, Bigby Creek, Somerset County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 77p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Bigby Run Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. The Bigby Run Dam appears to be in fair condition. Maintenance is considered fair. The concrete spillway is deteriorating with marked deterioration on the right spillway wall. Minor seepage was observed at the toe of the dam, adjacent to the left abutment contact. Seepage was estimated at 2 to 5 gallons per minute. The seepage should be monitored. The Bigby Run Dam is a high hazard-small size dam. The recommended Spillway Design Flood (SDF), for a dam of this size and classification, is in the range of 1/2 PMF to PMF. Since the Bigby Run Dam just meets the minimum criteria; and since the dam is located in a rural area suggesting only appreciable economic loss; compliance with the current practice of the Baltimore District Corps of Engineers leads to the selection of the 1/2 PMF as the Spillway Design Flood (SDF).

AD-A108 952/3 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Pioneer Lake Dam (NDI ID Number PA-431, DER ID Number 32-80), Susquehanna River Basin, Offstream, Hazelet Run, Indiana County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 71p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Pioneer Lake Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. The dam and appurtenant structures appear to be in fair condition. No major erosion was observed on the embankment crest. An erosion area was observed at the outlet for the 12 in. diameter cast iron pipe. Erosion at the outlet of the 12 in. diameter pipe exists on the downstream slope of the dam near the toe. Seepage 100 ft. right of the spillway channel was measured to be approximately 50 gallons per minute. A 30 in. corrugated metal pipe exists beneath the roadway near the outlet for the emergency spillway. It was observed during the inspection that the pipe is collapsing near the center of the pipe. Trees were observed growing along the upstream edge of the crest, and dense vegetation was observed along the entire length of the downstream slope. The Pioneer Lake Dam is a high hazard-small size dam. The recommended spillway design flood (SDF) for a dam of this size and classification is in the range of the 1/2 PMF to PMF. Due to the downstream potential for loss of life and property damage, the spillway design flood has been selected as the PMF. The spillway and reservoir are capable of controlling approximately 11% of the PMF without overtopping the embankment. Based on criteria established by the Corps of Engineers, the spillway is termed seriously inadequate. Pioneer Lake Dam is classified as unsafe, non-emergency.

AD-A108 953/1 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Camp Sinoquipe Lake Dam (NDI ID Number PA-1058, DER ID Number 29-29), Susquehanna River Basin, Plum Run, Fulton County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 63p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of the Camp Sinoquipe Lake Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. In general, the dam appears to be in fair condition. No major erosion was observed on the embankment crest or slopes during the inspection. The retaining wall located at the junction of the embankment and the spillway should be repaired due to undercutting caused by flows in the discharge channel. The condition of the reservoir drainline is questionable, based on a 1966 memorandum in the DER files which indicates the construction of the drainline deviated from the original design. Two seepage areas were observed during the inspection. One area was observed on the downstream slope in the area of the masonry retaining wall located at the junction of the embankment and spillway. The Camp Sinoquipe Lake Dam is a low hazard-small size dam. The recommended spillway design flood (SDF) for a dam of this size and classification is in the range of the 50-year storm to the 100-year storm. No homes were observed to exist in the potential downstream flood plain associated with a dam failure and no significant structures were observed in the flood plain. A township road exists approximately 1200 feet downstream of the dam and agricultural areas exist approximately one mile downstream of the dam. The spillway design flood has been selected as the 100-year storm. The visual observations, review of available data, hydrologic and hydraulic calculations and past operational performance indicate that the Camp Sinoquipe Lake Dam is capable of controlling the spillway design flood (100-year storm).

AD-A108 955/6 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. K-Section Dam (NDI ID Number PA-1045, DER ID Number 1-84), Potomac River Basin, Tributary to Toms Creek, Adams County, Pennsylvania, Carroll Valley Borough. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 60p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of the K-Section Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. The K-Section Dam appears to be in good condition and adequately maintained. No major deficiencies were observed during the inspection which were considered as significantly affecting the stability of the structure. Minor erosion areas were observed adjacent to the right spillway approach and discharge channel walls. No seepage was observed during the inspection. A wet area was observed along the downstream toe of the dam. No control exists for the 24 in. drainline through the embankment. A piece of plywood has been bolted to the end of the pipe at the outlet. The K-Section Dam is a low hazard-small size dam. The recommended spillway design flood (SDF) for a dam of this size and classification is in the range of the 50-year storm to the 100-year storm. No homes or structures were observed in the potential flood wave associated with a dam failure. It should be noted that future development downstream of the dam could increase the hazard classification of the dam. A change in the hazard classification would warrant the formulation of an emergency action plan to warn downstream residents of imminent failure of the dam. The spillway design flood has been selected as the 100-year storm. The spillway and reservoir are not capable of controlling the 100-year storm. Therefore, the spillway is rated as inadequate.

AD-A108 956/4 PC **A05**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Hamlin Lake Park Dam (NDI ID Number PA-1014, DER ID Number 42-17), Ohio River Basin, Marvin Creek, McKean County, Pennsylvania, Borough of Smethport. Phase I Inspection Report,
R. Jeffrey Kimball. Aug 81, 79p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Hamlin Lake Park Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. Hamlin Lake Park Dam is a high hazard-small size dam. The recommended spillway design flood (SDF) for a dam of this size and classification, is in the range of 1/2 PMF to PMF. Based on the height of dam, storage capacity of the reservoir, and flow capacity of Marvin Creek the spillway design flood has been selected as the 1/2 PMF. Hamlin Lake Park Dam is capable of controlling approximately 9% of the PMF without overtopping the earthen embankment section. The breach analysis and downstream routing of the flood wave does not indicate an increased potential for loss of life from that which existed just prior to failure of the dam due to overtopping. Therefore, the spillway is termed inadequate, but not seriously inadequate.

AD-A108 957/2 PC **A04**/MF **A01**
D'Appolonia Consulting Engineers, Inc., Pittsburgh, PA.
National Dam Inspection Program. Rossiter Dam (NDI I.D. PA-1080, DER I.D. 032-019), Ohio River Basin, Straight Branch Run, Indiana County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Aug 81, 65p
Contract DACW31-81-C-0014
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the evaluation of existing conditions, the condition of Rossiter Dam is considered to be unsafe/nonemergency due to a seriously inadequate spillway capacity. The overall condition of the dam is considered to be poor. The spillway structures have partially collapsed and the dam is overgrown with large trees and thick brush, precluding a complete inspection. The spillway capacity was evaluated according to the rec-

ommended criteria and was found to be seriously inadequate. According to the recommended criteria, small dams in the high hazard category are required to pass from one-half to full Probable Maximum Flood (PMF). In view of the small size of the dam, one-half of the PMF was selected as the spillway design flood. Flood discharge capacity was evaluated according to the recommended procedure and was found to pass 20 percent of the PMF without overtopping the embankment. Since the spillway capacity is less than 50 percent of the PMF and results of a breach analysis indicate that the potential loss of life and downstream damage would be significantly increased due to a dam failure, the spillway is classified to be seriously inadequate. (Author)

AD-A108 958/0 PC **A05**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Lake Timberline Dam (NDI Number PA 00977, PennDER Number 58-125), Susquehanna River Basin, Tributary of Choconut Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Aug 81, 76p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Lake Timberline Dam is located on an unnamed tributary to Choconut Creek in Silver Lake Township, Susquehanna County, Pennsylvania. The impoundment created by the dam is used for recreation and fishing. Erosion was observed around both downstream ends of the spillway training walls. Minor erosion was also noted along the upstream face of the embankment at normal pool level. Brush and some small trees are growing on the downstream face of the embankment. Clear seepage was flowing from the toe of the embankment near the outlet pipe.

AD-A108 959/8 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Galvin Pond Dam (NDI Number PA 00602, PennDER Number 8-63), Susquehanna River Basin, West Branch of Trout Creek, Bradford County, Pennsylvania. Phase I Inspection Report.
John A. Dziubek. Jun 81, 69p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Galvin Pond Dam is owned by Mr. Walter Kirby and is classified as a 'Significant' hazard - 'Small' size dam. The dam was found to be in fair overall condition at the time of inspection. Hydraulic/hydrologic evaluation, performed in accordance with procedures established by the Baltimore District, Corps of Engineers, revealed that the spillway capacity is less than the peak inflow to the impoundment during the 100-year flood. A spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required for Galvin Pond Dam. Because the dam is on the low end of the 'Small' size category in terms of storage capacity and height, the 100-year flood was chosen as the SDF. The spillway is therefore considered 'Inadequate.' Several items of remedial work should be immediately initiated by the owner. These include: (1) Develop remedial measures to ensure that the dam is not overtopped by the 100-year flood; (2) Repair the two 12-inch steel pipes, fill the embankment to original crest elevation and reseed with grass; (3) Cut the trees and brush on the dam; and (4) Provide means to draw down the reservoir during an emergency.

AD-A108 960/6 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Horton Lake Dam (NDI Number PA 00070, PennDER Number 58-124), Susquehanna River Basin, Sterling Brook, Susquehanna County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Jun 81, 73p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Horton Lake Dam is located on Sterling Brook in Lenox Township, Susquehanna County, Pennsylvania. The impoundment created by the dam is used for recreation and fishing. A steel plate operated by a stem and hand wheil from the top of the embankment acts as a gate valve for the emergency outlet works. There are no operation or maintenance records for this gate valve. It is recommended that a formal operation and preventive maintenance schedule be developed and implemented. There is no warning system in the event of dam failure. It is recommended that an emergency warning system be developed. The current operational features are adequate for the purpose they serve. However, it is recommended that a formal maintenance and operations manual be prepared for the dam.

AD-A108 961/4 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Hathaway Pond Dam (NDI ID Number PA 00050, PennDER Number 58-06), Susquehanna River Basin, West Branch of Lackawanna River, Susquehanna County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Jun 81, 72p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Hathaway Pond Dam is located in Ararat Township, Susquehanna County, Pennsylvania. The reservoir was originally created to provide water for power purposes. The reservoir slopes are moderate with a good cover of vegetation. There are three ponds upstream from Hathaway Pond Dam on two tributary streams. The western stream contains Romobe Lake (PennDER I.D. No. 58-10) which is 1750 feet upstream from Hathaway Pond Dam. The eastern tributary contains Ball Lake and an unnamed smaller pond in series. Ball Lake is 2450 feet upstream and will retain considerable storage while the smaller unnamed pond was considered to have no effect on Hathaway Pond Dam. Two homes, a trailer, and township road are located 1800 feet downstream from Hathaway Pond Dam. These could suffer economic damage in the event of a dam failure.

AD-A108 962/2 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Warner Dam (NDI Number PA 00975, PennDER Number 58-71), Susquehanna River Basin, Tributary of Snake Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Aug 81, 67p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Warner Dam is owned by William S. Newlin, Jr., and is classified as a 'Low' hazard - 'Small' size dam. The dam was found to be in fair overall condition at the time of inspection. Hydraulic/hydrologic evaluations revealed that the spillway capacity is less than the peak inflow to the impoundment during the 100-year flood. A spillway design flood (SDF) in the range of the 50-year flood to the 100-year flood is required for Warner Dam. The 100-year flood was chosen as the SDF. The spillway is therefore considered 'Inadequate.' It is recommended that the owner immediately develop remedial measures to provide adequate spillway capacity. The inspection revealed certain items of remedial work which should be performed by the owner without delay. These include: (1) Provide adequate spillway capacity; (2) Repair the spalling on the downstream face of the concrete corewall; (3) Ensure that the outlet works are operable, or develop an emergency drawdown plan; and (4) Cut all trees on the embankment at ground level. All trees with a trunk diameter greater than 3 inches should have their root systems removed. All resultant areas of erosion and cavities should be filled, graded, compacted and seeded. In addition, the following operational measures are recommended to be undertaken by the owner: (1) Develop a detailed emergency operation and warning system; (2) During periods of unusually heavy rainfall, provide around-the-clock surveillance of the dam; and (3) When warning of a storm of major proportions is given by the National Weather Service, activate the emergency operation and warning system.

AD-A108 963/0 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Miller's Pond Dam (NDI Number PA 01004, PennDER Number 8-27), Susquehanna River Basin, Miller's Run, Bradford County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Jun 81, 68p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Miller's Pond Dam is owned by Ernest Weaver and is classified as a 'Low' hazard - 'Small' size dam. The dam was found to be in poor overall condition at the time of inspection. Hydraulic/hydrologic evaluations revealed that the spillway will pass the 100-year flood without overtopping the dam. A spillway design flood (SDF) in the range of the 50-year flood to the 100-year flood is required for Miller's Pond Dam. The 100-year flood was chosen as the SDF. Therefore, the spillway is considered 'Adequate'. There are two seeps, approximately 5 g.p.m. and 1 g.p.m., and a minor boil near the downstream toe of the dam. There are depressions along the upstream crest which may indicate 'piping' of the embankment materials. These ares should be monitored. Several items of remedial work should be immediately initiated by the owner. These include: (1) Monitor the two areas of seepage at regular intervals and during periods of high reservoir levels for turbidity and/or increase in flow, which may indicate the potential for piping of embankment material. If turbidity or increased flows are noted, a qualified geotechnical engineering firm should be retained to recommend remedial measures. (2) Fill, compact, and seed the depressions on the crest of the dam. (3) Cut all trees and brush on the embankment at ground level. (4) Clear the spillway approach channel of all debris and protect with riprap. (5) Repair the discharge apron and training walls. (6) Fill and seed the areas of erosion behind the wingwalls. (7) Protect the channel immediately downstream from the embankment with erosion protection. (8) Provide means to draw down the reservoir during an emergency.

AD-A108 964/8 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Steinhauer Dam (NDI Number PA 00947, PennDER Number 8-64), Susquehanna River Basin, Unnamed Tributary of Roaring Run, Bradford County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Jun 81, 75p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The dam was found to be in fair overall condition at the time of inspection. Hydraulic/hydrologic evaluations, performed in accordance with procedures established by the Baltimore District, Corps of Engineers, for Phase I Inspection Reports, revealed that the spillway capacity is less than the peak inflow to the impoundment during the 100-year flood. A spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required for Steinhauer Dam. Because the dam is on the low end of the 'Small' size category in terms of storage capacity and height, the 100-year flood was chosen as the SDF. The spillway will not pass the SDF without overtopping the dam. The spillway is therefore considered inadequate.

AD-A108 965/5 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Mosquito Run Dam (NDI Number PA01012, PennDER Number 41-2), Susquehanna River Basin, Mosquito Creek, Lycoming County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Aug 81, 71p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Mosquito Run Dam is owned by Williamsport Municipal Water Authority and is classified as a 'Significant' hazard - 'Small' size dam. The dam was found to be in good overall condition at the time of inspection. A spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required for Mosquito Run Dam. Because the dam is on the low end of the 'Small' size category in terms of height and storage capacity, the 100-year flood was chosen as the SDF. Hydraulic/hydrologic evaluations, performed in accordance with procedures established by the Baltimore District Corps of Engineers, for Phase I Inspection Reports, revealed that the spillway capacity is greater than the inflow to the impoundment during the 100-year flood. The spillway is therefore considered 'Adequate.' The inspection revealed certain items of remedial work which should be performed by the owner without delay.

AD-A108 966/3 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.

National Dam Inspection Program. Maggio Estate Dam Number 2 (NDI Number PA01120, PennDER Number 41-103), Susquehanna River Basin, Red Run, Lycoming County, Pennsylvania. Phase I Inspection Report.
John A. Dziubek. Aug 81, 67p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Maggio Estate Dam No. 2 is owned by the Estate of Michael Maggio and is classified as a 'Significant' hazard - 'Small' size dam. The dam was found to be in fair overall condition at the time of inspection. Hydraulic/hydrologic evaluates, performed in accordance with procedures established by the Baltimore District Corps of Engineers, for Phase I Inspection Reports, revealed that the spillway capacity is less than the inflow to the impoundment during the 100-year flood. A spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required for Maggio Estate Dam No. 2. Because the dam is on the low end of the 'Small' size category in terms of height and storage capacity, the 100-year flood was chosen as the SDF. The spillway is therefore considered 'Inadequate.' It is recommended that the owner develop remedial measures to ensure that the dam will not be overtopped by the 100-year flood. The inspection revealed certain items of remedial work which should be performed by the owner without delay.

AD-A108 967/1 PC **A04**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Morris Run Mine Dam Number 3 (NDI Number PA01027, PennDER Number 59-8), Susquehanna River Basin, Morris Run, Tioga County, Pennsylvania. Phase I Inspection Report.
John A. Dziubek. Aug 81, 73p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Morris Run Mine Dam No. 3 is owned by the Borough of Morris Run, Pennsylvania, and is classified as a 'Significant' hazard - 'Small' size dam. The dam was found to be in fair overall condition at the time of inspection. Hydraulic/hydrologic evaluations, performed in accordance with procedures established by the Baltimore District Corps of Engineers, for Phase I Inspection Reports, revealed that the spillway will pass the 100-year flood without overtopping the dam. A spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required for Morris Run Mine Dam No. 3. Since the dam is on the low end of the 'Small' size category in terms of storage capacity, the 100-year flood was chosen as the SDF. The spillway capacity is greater than the inflow to the impoundment during the 100-year flood. The spillway is therefore considered 'Adequate'. Several items of remedial work should be immediately initiated by the owner.

AD-A108 968/9 PC **A04**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Spring Grove Dam (NDI Number PA-01028, DER Number 67-004), Susquehanna River Basin, York County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 74p
Contract DACW31-81-C-0013
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in fair condition. In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is significant. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of the 100 year flood to one-half the Probable Maximum Flood (PMF). The recommended SDF for this structure is the 100 year flood. The spillway capacity is sufficient for passing the SDF peak inflow without overtopping the dam. The spillway, therefore, is considered to be adequate. Recommendations are presented for immediate action by the owner.

AD-A108 969/7 PC **A05**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Stouffer Lake Dam (NDI Number PA-01011, DER Number 38-082), Susquehanna River Basin, Lebanon County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 83p
Contract DACW31-81-C-0013
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in fair condition. In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is high. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of one-half the Probable Maximum Flood (PMF) to the full PMF. The recommended SDF for this structure is one-half the PMF. The spillway capacity is adequate for passing 29 percent of the PMF peak inflow without overtopping the dam. Failure of the embankment due to overtopping by one-half of the PMF would not significantly increase the risk to loss of life downstream. The spillway, therefore, is considered to be inadequate, but not seriously inadequate. Recommendations are presented for immediate action by the owner.

AD-A108 970/5 PC **A04**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Lake Conewago Dam (NDI Number PA-00593, DER Number 38-012), Susquehanna River Basin, Lebanon County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 59p
Contract DACW31-81-C-0013
Original contains color plates: All Dtic and NTIS reproductions will be in black and white.

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in poor condition. In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small, and the hazard classification is significant. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of the 100 year flood to one-half the Probable Maximum Flood (PMF). The recommended SDF for this structure is the 100 year flood. The spillway capacity is insufficient for passing the SDF without overtopping the dam. The spillway, therefore, is considered to be inadequate. Recommendations are presented for immediate action by the owner.

AD-A108 971/3 PC **A04**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Kehm Run Dam (NDI Number PA-01029, DER Number 67-483), Susquehanna River Basin, York County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 60p
Contract DACW31-81-C-0013
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The purpose of this inspection is to determine if the dam constitutes a hazard to human life and property. Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in poor condition. In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small, and the hazard classification is significant. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of the 100-year flood to one-half the Probable Maximum Flood (PMF). The recommended SDF for this structure is the 100-year flood. The spillway capacity is sufficient for passing the SDF peak inflow without overtopping the dam. The spillway, therefore, is considered to be adequate.

AD-A109 053/9 PC **A05**/MF **A01**
Johns-Manville Sales Corp., Denver, CO. Research and Development Center.
Development of Precoat Filtration Technology for Reverse Osmosis Units.
Final rept.,
G. R. Bell, and G. Robles. 20 Nov 81, 98p
Contract DAAK70-79-C-0046

this project was undertaken to determine whether diatomaceous earth filter aid (DE) filtration would be an effective alternative for the presently specified multimedia filter on the 600 GPH ROWPU. The project included both filtration studies and small scale reverse osmosis membrane fouling tests for several types of water sources. Data from six different water sources, two bench studies and four field studies, demonstrated that DE can easily meet, and if necessary exceed, the criteria set by the Army for multi-media filtered water for RO feed. For most tests a filter aid prepared by coating CELITE 503 with aluminum hydrate had the best balance between filtered water quality and cycle length. Such a filter aid could be purchased ready mixed greatly simplifying operation. Three RO 'life' tests were attempted. One was aborted after the membrane was damaged by chlorine from an extraneous source. The other two were successfully completed without evidence of particulate fouling of the membranes. (Author)

AD-A109 059/6 PC **A02**/MF **A01**
California Univ., Irvine. Combustion Lab.
Mechanisms of Exhaust Pollutants and Plume Formation in Continuous Combustion.
Annual rept. 1 Mar 80-28 Feb 81,
G. S. Samuelsen. Mar 81, 16p UCI-ARTR-81-03, AFOSR-TR-81-0814
Grant AFOSR-78-3586
See also AD-A054 844.

During this period, emphasis has been placed on the construction, evaluation, and operation of a two-color laser anemometry (LA) system. Detailed velocity and turbulence intensity measurements have also been acquired in a water analog of the opposed jet configuration, and are scheduled for the centerbody configuration. Application of the numerical code to this case was initiated during the present reporting period for both the opposed jet and centerbody configurations, and the results are being checked with the experimental data as they become available. High-speed photography has been employed in both the combustor and hydrodynamic facilities to study the swirl and non-swirl performance of the centerbody configuration, and to optimize the design. Techniques have been developed (dyes in the hydrodynamic system and smoke in the combustor) to visually record the penetration and dynamics of the fuel jet. The NO probe experiments have addressed the effect of potentially resistant materials, and a refined experiment for the introduction of water and low concentrations of hydrocarbons typical of turbine emission has been completed. Data provide guidelines for the materials and temperature limits to employ in the measurement of NO(x).

AD-A109 090/1 PC **A05**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
National Dam Inspection Program. Loomis Lake Dam (NDI Number PA 00048, PennDER Number 58-127), Susquehanna River Basin, Unnamed Tributary to Hop Bottom Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
John A. Dziubek. Jun 81, 86p
Contract DACW31-81-C-0011
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Loomis Lake Dam is located on an unnamed tributary to Hop Bottom Creek in Bridgewater Township, Susquehanna County, Pennsylvania, approximately 3.4 miles east of Montrose. The reservoir slopes are moderate with a good growth of ground cover. A small amount of sedimentation was present in the upper portion of the reservoir. One home and one garage are located downstream of the dam. Loss of life may occur in the event of a dam failure. In addition, the township road may suffer economic damage.

AD-A109 091/9 PC **A05**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Harmar Refuse Bank Dam (NDI Number PA-00835, PennDER Number 2-53). Ohio River Basin, Tributary to Guys Run, Allegheny County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 82p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC/NTIS reproductions will be in black and white.

The Harmar Refuse Bank is located on an unnamed tributary to Guy's Run in Harmar Township, Allegheny County, Pennsylvania, approximately one mile north of Harmarville, Pennsylvania. Harmar Refuse Bank was constructed as a disposal area for coarse and fine coal

refuse from the Harmar Mine and Preparation Plant. Harmar Refuse Bank was assigned a 'high' hazard potential rating. This rating is based on the observed height and impounding capacity of the pond and the downstream floodplain conditions, which included numerous inhabited dwellings and Guy's Run Road. Failure of the Harmar Refuse Bank could result in significant disruption of commercial activities and loss of more than a few lives could result.

AD-A109 092/7 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Montour Number 4 Refuse Bank (NDI Number PA 00865, PENN DER Number 63-92), Ohio River Basin, Tributary to Chartiers Creek, Washington County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 74p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a review of available information, visual observations of conditions as they existed on the date of the field inspection, and supporting engineering calculations, the general condition of the Montour No. 4 Refuse Bank is considered to be fair. This assessment is based primarily on visual observations of the embankment. The structure is classified as a large size, significant hazard dam. Corps of Engineers guidelines recommend the Probable Maximum Flood (PMF) as the Spillway Design Flood for a large size significant hazard dam. Montour No. 4 Refuse Bank's Spillway Design Flood is the Probable Maximum Flood. Reservoir capacity is 'adequate' because the non-overtopping flood inflow was found, by using the HEC-1 computer program, to be in excess of 100 percent of the PMF.

AD-A109 093/5 PC **A05**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Glenwood Lake Dam (NDI ID Number PA-00327, DER ID Number 35-143), Susquehanna River Basin, Covey Creek, Lackawanna County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Jul 81, 88p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on visual inspection, past performance, field surveys and calculations, Glenwood Lake Dam is judged to be in poor condition. The recommended Spillway Design Flood (SDF) for the size (small) and hazard classification (high) of the dam is between the one-half Probable Maximum Flood (1/2 PMF) and the full PMF. Based on the small size and storage capacity, it is judged that the SDF of 1/2 PMF is appropriate for the Glenwood Lake Dam. Under the present conditions, the spillway will pass approximately 10 percent of the PMF without overtopping the dam. Overtopping depths of 1.1 feet and 2.12 feet were calculated for flood magnitudes of 20% and 50% of the PMF, respectively. It was judged that the dam will begin to fail under an overtopping depth of one-foot. Because the present spillway capacity would not pass the SDF without overtopping the dam and failure of the dam would increase the downstream hazard to life and property, the spillway is rated as seriously inadequate and the dam is rated as unsafe, non-emergency. The facility is not properly maintained, as evidenced by the extensive growth of trees on the embankment and the condition of the outlet works valve pit. There is no warning system and evacuation plan in effect at the present time.

AD-A109 094/3 PC **A04**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Bayly Pond Dam (NDI ID Number PA-00343, DER ID Number 64-205), Delaware River Basin, Branch of Holbert Creek, Wayne County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Jul 81, 63p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The Bayly Pond Dam is judged to be in good structural condition based on the visual inspection. Based on the location of the downstream dwellings and the fact that a few lives could be lost should the dam fail, the dam is classified as a significant hazard dam. Based on criteria established for these studies, the recommended Spillway Design Flood (SDF) varies between the 100-year flood and 1/2 of the Probable Maximum Flood (1/2 PMF). Because of the small reservoir storage capacity, the 100-year flood was selected for the SDF. Since the spillway cannot the 100-year flood without overtopping the dam, the spillway is rated as inadequate. The following investigations and remedial measures are recommended for immediate implementation by the owner. All investigations and design of remedial measures should be performed under the direction of a Professional Engineer, experienced in the design and construction of dams. (1) Increase the spillway capacity to pass at least the 100-year flood flow without overtopping and the dam and the dike. (2) Stabilize the upstream face of the dam against wave erosion. (3) Verify the operational condition of the intake valve and provide other means to draw down the reservoir level in emergencies, should the valve be found inoperative. (Author)

AD-A109 095/0 PC **A04**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Perch Pond Dam (NDI ID Number PA-00135, DER ID Number 64-23), Delaware River Basin, Branch of Shehawken Creek, Wayne County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 59p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Perch Pond Dam is a composite earthfill-masonry structure, consisting of an earthfill embankment located between two dry stone masonry walls. The upstream wall is covered with concrete on the lake side of the wall. The dam is 165 feet long and 13.5 feet high. The crest is 16 feet wide, including the masonry walls. The spillway is a 12.7 foot long broad crested weir with a center pier that is 2.1 feet wide. The outlet works for the dam is an 8-in. cast iron pipe through the dam. Details of the inlet and the operational status of the outlet works could not be determined. Perch Pond Dam is judged to be in good structural condition, based on the visual inspection. Since the spillway cannot pass the 100-year flood without overtopping the dam, the spillway is rated as inadequate.

AD-A109 096/8 PC **A05**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Marshall Lake Dam (NDI ID Number PA-00985, DER ID Number 45-52), Delaware River Basin, Pond Creek, Monroe County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Jul 81, 89p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Marshall Lake Dam is an earthfill embankment approximately 9 feet high and 305 feet long, including spillway. The spillway is located at the right abutment, consisting of an 80 foot long and 1.5 foot wide concrete weir. The weir intersects the slope of the right abutment and terminates at a vertical concrete endwall on the earthfill dam embankment. The outlet works consist of a 24-inch diameter steel pipe with no visible upstream or downstream controls. Based on visual inspection, Marshall Lake Dam is judged to be in poor condition. Under the present conditions, the spillway will pass approximately 4 percent of the PMF without overtopping the dam.

AD-A109 097/6 PC **A04**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Lake Como Dam (NDI ID Number PA-00130, DER ID Number 64-16), Delaware River Basin, Kinnaylile Creek, Wayne County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 74p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Lake Como Dam is a composite structure consisting of an upstream earth embankment and a downstream near-vertical stone wall. The dam is 12.2 feet high and 196 feet long, including spillway. The spillway is located near the middle of the dam, consisting of a 28.3-foot long sharp crested concrete weir, terminating with vertical concrete endwalls. There are no facilities to drain the reservoir. Based on visual inspection, field survey, available records, calculations and past operational performance, Lake Como Dam is judged to be in fair condition. Because the spillway capacity of 535 cfs is less than the estimated 1240 cfs peak discharge of the 100-year flood, the spillway capacity is rated as inadequate. Considering the rotted condition of the plank sheeting to the right of the spillway wall, further deterioration of the sheeting may cause leakage and the stability of the dam could, in time, be affected.

AD-A109 098/4 PC **A05**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Ponderosa Pines Dam (NDI ID Number PA-00304, DER ID Number 64-204), Delaware River Basin, Tributary to West Branch Lackawaxen River, Wayne County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 80p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on visual inspection, field survey and calculations, Ponderosa Pines Dam is judged to be in poor condition. As the spillway cannot pass the 1/2 PMF without overtopping at less than 1/2 PMF would cause failure which would significantly increase hazard to loss of life downstream, the spillway capacity is seriously inadequate and the facility is rated unsafe, nonemergency. Although there is no visible evidence of structural instability, the erosion of the downstream slope below the outlet pipe and the leakage below the toe of the dam are of concern. Should the observed erosion and leakage remain unchecked, it could, in time, affect the structural integrity of the dam. The invert elevation of the outlet pipe is but 2.1 feet below the spillway crest. There are no means to lower the reservoir level below the present level of the pipe inlet in case of emergency. The maintenance of the dam is limited to mowing grass on the crest and a portion of the upstream slope of the embankment. The balance of the dam is poorly maintained.

AD-A109 099/2 PC **A04**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Deckers Dam (NDI ID Number PA-00299, DER ID Number 64-203), Delaware River Basin, Seeley Brook, Wayne County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Jul 81, 74p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on visual inspection, the Deckers Dam is judged to be in good condition. The spillway capacity of Deckers Dam is rated as adequate. The unknown condition of the valve, regulating flow through the outlet pipe, precluded assessment of the outlet works. Observations during pressure flow conditions in the outlet pipe are essential to the safety evaluation of the dam. A ready access to an operable valve, or other method of drawing down the reservoir level during emergencies, is required. Although the dam and appurtenances appear to be in good repair, there is no formal maintenance program for the facility. There is no warning system and evacuation plan in effect at the present time.

AD-A109 100/8 PC **A05**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Maple Lake Dam (NDI ID Number PA-01026, DER ID Number 57-38), Susquehanna River Basin, Branch of Blackwater Run, Sullivan County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 100p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Maple Lake Dam is an earthfill embankment 14.4 feet high and 283 feet long, excluding spillway. The emergency spillway is located at the left abutment, consisting of an earth channel having a trapezoidal cross section. The bottom width of the spillway at the reservoir outlet is 56 feet. A service spillway, consisting of a 12-inch riser pipe and an 8-inch diameter outlet pipe, is located approximately 100 feet from the right abutment. The outlet works was reported to consist of an 8-inch diameter asbestos cement pipe, extending upstream of the riser pipe to the reservoir and terminating with two sections of an 8-inch diameter vitrified clay pipe, having a concrete plug at the inlet. Based on

visual inspection, the Maple Lake Dam is judged to be in good condition. Under the present conditions, the spillway will pass approximately 37 percent of the PMF. Should the top of the dam be restored to its design elevation, the spillway could pass the SDF without overtopping the dam.

AD-A109 101/6 PC **A05**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Glenburn Pond Dam (NDI ID Number PA-00371, DER ID Number 35-1), Susquehanna River Basin, Dalton Run, Lackawanna County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 89p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Glenburn Pond Dam is a composite earthfill and dry stone masonry structure, terminating with an earthfill embankment on the left abutment. The 16.3-foot high dam has a total length of 190 feet, including the spillway and the earthfill embankment section. The spillway, located at the middle of the dam, consists of a broad crested concrete weir with an effective length of 51 feet. The upstream approach to the spillway has an earthfill bottom with stone and mortar side walls. There are no other constructed outlets through the dam. Based on available records, past performance, visual inspection, field survey and calculations, the Glenburn Pond Dam is judged to be in poor condition. The present spillway capacity of 464 cfs (cubic feet per second) can pass approximately 2% of the PMF; it is classified as seriously inadequate and the facility is rated unsafe, non-emergency. The bulging dry stone wall and the gradual loss of stone from the supporting buttress wall are of concern. The observed conditions suggest that additional investigations are required to determine the extent of remedial measures necessary to insure the structural integrity of the dam.

AD-A109 102/4 PC **A04**/MF **A01**
Geo-Technical Services, Inc., Harrisburg, PA.
National Dam Inspection Program. Acre Pond Dam (NDI ID Number PA-00973, DER ID Number 58-34), Susquehanna River Basin, Partners Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report,
Gideon Yachin. Aug 81, 59p
Contract DACW31-81-C-0019
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on visual inspection, Acre Pond Dam is judged to be in fair structural condition. In the absence of an adequate spillway, the dam is subject to frequent overtopping. Based on the location of the downstream dwellings and the fact that a few lives could be lost should the dam fail, the dam is classified as a significant hazard dam. Since the spillway cannot pass the 100-year flood without overtopping the dam, the spillway is rated as inadequate. Although there is some seepage thru the dam, there is no evidence of structural instability. There is no formal inspection and maintenance program or warning system and evacuation plan in effect at Acre Pond Dam. The dam is not properly maintained.

AD-A109 103/2 PC **A04**/MF **A01**
Woodward-Clyde Consultants, Plymouth Meeting, PA.
National Dam Inspection Program. Lower Rickards Dam (NDI Number PA 01107, DER Number 52-103), Delaware River Basin, Hornbecks Creeks, Pike County, Pennsylvania. Phase I Inspection Report,
Mary F. Beck, and John H. Frederick, Jr. Jul 81, 69p
Contract DACW31-81-C-0025
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Lower Rickards is a privately owned dam used for recreational purposes. The dam is in poor condition and the spillway is in good condition. Hydrologic and hydraulic computations indicate that the spillway structure is not capable of discharging the 100-Year event. Thus, the spillway is considered to be 'Inadequate'.

AD-A109 104/0 PC **A05**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. North Arrowhead Lake Dam (NDI ID PA 00743, PA DER 45-246), Delaware River Basin, Unnamed Tributary of Trout Creek, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 86p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

North Arrowhead Lake Dam is an 11-year old earth embankment which impounds a lake used for recreational purposes. The dam is constructed in two sections: a ,1400-foot long, 21-foot high earth embankment dam with a 60-foot wide concrete ogee spillway at its eastern abutment, and a 970-foot long, 14-foot high earth embankment levee, located approximately 1,000 feet to the east of the dam. Thee spillway is classified as 'Adequate'. Based upon visual inspection of the dam and review of the drawings provided by the Pennsylvania Department of Environmental Resources (DER), North Arrowhead Lake Dam is considered to be in poor condition.

AD-A109 105/7 PC **A04**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Arlington Lake Dam (NDI ID PA 00321, PA DER 45-5), Delaware River Basin, Big Meadow Run, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 70p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Arlington Lake Dam is an earth and concrete structure approximately 240 feet long with a maximum height of about 13 feet. A two stage, ungated overflow spillway system is located at the left abutment of the dam. A drop inlet spillway is located at the approximate midpoint of the embankment. Arlington Lake Dam has a drainage area of approximately 1.7 square miles and impounds a reservoir with a maximum storage capacity of about 51 acre-feet at the low point of the top of the dam. The spillway system is classified as 'seriously inadequate'. The dam is classified as 'unsafe, non-emergency'. Based on the visual observations, discussions with the owner, and information obtained from the pennsylvania Department of Environmental Resources, Division of Dam Safety, Arlington Lake Dam is considered to be in poor condition.

AD-A109 106/5 PC **A05**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Lake Akiba Dam (NDI ID PA 00640, PA DER 45-120), Delaware River Basin, Sandspring Creek, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 80p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Lake Akiba Dam is a 360-foot long, 22-foot high earth embankment dam, constructed in 1926 to provide a lake for recreational use. The maximum storage capacity of Lake Akiba is 280 acre-feet. The dam has a crest width of approximately seven feet and side slopes both upstream and downstream which average 2H:1V. Based upon the visual inspection of the dam review of the information provided by the Pennsylvania Department of Environmental Resources (Der), the Lake Akiba Dam is considered to be in fair condition. The spillway, however, is in poor condition an should be investigated immediately.

AD-A109 107/3 PC **A04**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Hunter Lake Dam (NDI ID PA 00774, PA DER 45-136), Delaware River Basin, Rocky Run Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 61p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Hunter Lake Dam is an earth embankment with a sheet timber core about 300 feet long and 13 feet high. The embankment has a top width of 42 feet and downstream and upstream slopes of 2H:1V an 1H:1V, respectively. The dam was constructed in 1928-29 to provide a lake for recreational purposes. Based on the visual observations, discussions with the Owner's representative, and information obtained from the Pennsylvania Department of Environmental Resources, Division of Dam Safety, Hunter Lake Dam is considered to be in fair condition.

AD-A109 108/1 PC **A05**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Milltown Dam (NDI Number PA-00218, DER Number 15-146), Delaware River Basin, Chester County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 98p
Contract DACW31-81-C-0013
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the visual inspection, past performance and the available engineering data, the dam its appurtenant structures appear to be in poor condition. The Spillway is considered to be seriously inadequate, and the facility is classified as unsafe, non-emergency. The following are among the recommendations presented for immediate action by the owner: (1) That, in lieu of improving the facilities, the embankment be breached after obtaining a permit from the Bureau of Dam Safety, Obstruction and Storm Water Management, Pennsylvania Department of Environmental Resources; (2) That a detailed hydrologic and hydraulic engineering analysis be made by a professional engineer with experience in the design and construction of dams to determine means for providing adequate spillway capacity; and (3) That the upstream and downstream slopes and the crest be cleared of all trees, brush and debris under thee supervision of a professional engineer experience in the design and construction of dams. The embankment shall be provided with an adequate protective cover and be maintained on a regular basis. (Author)

AD-A109 109/9 PC **A05**/MF **A01**
Woodward-Clyde Consultants, Plymouth Meeting, PA.
National Dam Inspection Program. Rakes Dam (NDI Number PA-00993, DER Number 45-148), Delaware River Basin, Pond Creek, Monroe County, Pennsylvania. Phase I Inspection Report,
Mary F. Beck, and John H. Frederick, Jr. Jul 81, 81p
Contract DACW31-81-C-0025
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Rakes Dam is a privately owned dam used for recreational purposes. The dam i s currently in fair condition and is poorly maintained and the spillway and pond drain are in poor condition requiring maintenance. The structure is considered to have an 'Adequate' spillway capacity.

AD-A109 110/7 MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Analomink Lake Dam (NDI ID PA 00638, PA DER Number 45-32), Delaware River Basin, Unnamed Tributary of Brodhead Creek, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 60p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Analomink Lake Dam is an 11-foot high, 280-foot long rock fill and earth embankment, built approximately 70 years ago to provide an impoundment for recreational purposes. The dam has an average crest width of eight feet and a downstream slope which varies from 1H:1V to nearly vertical. The upstream face of the dam is almost completely submerged, but it is believed to have a much flatter slope than the downstream face. The Spillway is classified as Inadequate. Based upon the inspection of the dam and review of the information provided by the Pennsylvania Department of Environmental Resources (DER), Analomink Lake Dam is considered to be in poor condition.

AD-A109 111/5 MF **A01**
Woodward-Clyde Consultants, Plymouth Meeting, PA.
National Dam Inspection Program. Stanford Avenue Stormwater Retention Pond (NDI Number PA-01146, DER Number 6-467), Delaware River Basin, Tributary to Wyomissing Creek, Berks County, Pennsylvania. Phase I Inspection Report,
Mary F. Beck, John H. Frederick, Jr., and James W. Peck. Jul 81, 83p
Contract DACW31-81-C-0025
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

The pond and dam which are owned by the Township of Spring, are used to control stormwater runoff. The main embankment is in good condition with the excep-

tion of the vegetation on the crest which is in poor condition. The dike is considered to be in poor condition and the spillway is considered to be in good condition. It is recommended that the following measures be undertaken as soon as practical: (1) The downstream slope and crest of the dike should be repaired and stabilized to prevent further deterioration; (2) The sand and crushed stone should be removed from thee drain outlets. The drains should be monitored after the embankment has retained a significant head of water to verify that the material observed does not represent a migration of materials from beneath the spillway; (3) The gullies at the downstream junction of the embankment and left abutment should be repaired. The embankment crest should be reseeded; and (4) Consideration should be given to installing a trash rack at the low level outlet in the event that the fence should fail during a large storm permitting large debris to enter the reservoir area. (Author)

AD-A109 114/9 PC **A05**/MF **A01**
Woodward-Clyde Consultants, Plymouth Meeting, PA.
National Dam Inspection Program. Sun Valley Dam (NDI Number PA-00998, DER Number 45-217), Delaware River Basin, Pohopoco Creek, Monroe County, Pennsylvania. Phase I Inspection Report,
Mary F. Beck, and John H. Frederick, Jr. Jul 81, 77p
Contract DACW31-81-C-0025
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Sun Valley Dam is owned by the Sun Valley Lake Corporation and is used for private recreational purposes. The spillway is in good condition and the embankment and emergency spillway are in poor condition. Internal piping may be acting to diminish the overall stability of the dam. In accordance with criteria established by Federal (OCE) Guidelines, the recommended spillway design flood for this 'Small' and 'Significant' hazard classification is the 100-year flood to one-half the Probable Maximum Flood. Based on the small capacity of the reservoir and the limited downstream development, the 100-year event has been selected as the spillway flood. Hydrologic and hydraulic computations indicate that the spillway structure is not capable of discharging the 100-year event. Thus, the spillway facilities of Sun Valley Dam are considered to be 'Inadequate'.

AD-A109 115/6 PC **A04**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
National Dam Inspection Program. Lake Strause Dam (NDI Number PA-01010, DER Number 38-068), Susquehanna River Basin, Lebanon County, Pennsylvania. Phase I Inspection Report,
Hendrik Jongsma. Jul 81, 58p
Contract DACW31-81-C-0013
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in good condition. In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is significant. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of the 100 year flood to one-half the Probable Maximum Flood (PMF). The recommended SDF for this structure is the 100 year flood. The spillway capacity is insufficent for passing the SDF peak inflow without overtopping the dam. The spillway, therefore, is considered to be inadequate. The following recommendations are presented for immediate action by the owner: (1) That provisions be made to increase the spillway capacity. (2) That the bare areas on the downstream slope be reseeded. (3) That the drop inlet structure be inspected for structural adequacy after the reservoir has been lowered. (4) That the struts in the spillway be removed and that the wooden waterway diversion poles be secured by other means. (5) That a formal surveillance and downstream warning system be developed for use during periods of high or prolonged rainfall. (6) That an operation and maintenance manual be prepared for guidance in the operation of the dam during normal and emergency conditions, and that a schedule be developed for the annual inspection of the dam and its appurtenant structures. (Author)

AD-A109 140/4 PC **A21**/MF **A01**
Corps of Engineers, Seattle, WA. Seattle District.
Wynoochee Hydropower/Fish Hatchery Study: Draft Feasibility Report and Environmental Impact Statement.
Nov 81, 484p

A wide range of planning criteria was used to evaluate the hydropower and fish enhancement alternatives, design options for the alternatives, and alternative plans for Wynoochee Dam. The alternatives included hydropower at Wynoochee Dam, various fish enhancement measures in the vicinity of Wynoochee Dam, and no action. The tentatively selected plan is a 10.2-megawatt (nameplate) hydropower addition to Wynoochee Dam which would produce an average of 37,400 megawatthours energy per year and a 396,000-pound (190 cubic feet per second) hatchery for anadromous fish 3,000 feet downstream of Wynoochee Dam which would add 129,000 adult fish annually to the anadromous fish harvest. Total fish enhancement would be 118,450 fish. Two satellite fish stations for enhancement of fish runs on other Washington coastal rivers are included in the plan. The tentatively selected plan meets the two planning objectives of this study. (Author)

AD-A109 154/5 PC **A04**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.
National Dam Inspection Program. Elmcrest Dam (NDI ID Number PA-00347, DER ID Number 35-142), Susquehanna River Basin, Tributary to Roaring Brook, Lackawanna County, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 67p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the criteria established for these studies, Elmcrest Dam is judged to be in fair condition. The recommended Spillway Design Flood (SDF) for the size and hazard classification of the dam varies between the 100-year flood and 1/2 of the Probable Maximum flood (PMF). The selected SDF is the 1/2 PMF. The existing spillway will pass only about 40 percent of the PMF before overtopping of the dam occurs. The spillway capacity is rated as inadequate. The computed spillway capacity is, at best, a rough approximation. It is judged that there is a severe potential for collection of debris at the spillway which could reduce the spillway capacity considerably. The outlet works is only capable of discharging when the reservoir is above normal pool elevation. Access to the outlet works valve is judged to be unsuitable. No conditions of immediate concern were observed at the embankment.

AD-A109 155/2 PC **A05**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Williamsburg Station Dam (NDI ID Number PA-540, DER ID Number 7-48), Susquehanna River Basin, Frankstown Branch, Juniata River, Blair County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 76p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Williamsburg Station Dam is based upon visual observations made at the time of inspection, review of available records and data, hydraulic and hydrologic computations and past operational performance. The inspection and review of data at the Williamsburg Station Dam did not reveal any problems which require emergency action. The dam appears to be in fair condition. The Williamsburg Station Dam is a high hazard-intermediate size dam. The Spillway Design Flood for a dam of this size and classification is the PMF. The spillway and reservoir are capable of controlling approximately 18% of the PMF. Based on criteria established by the Corps of Engineers, the spillway is termed inadequate. This dam is a run-of-river type dam with inflow discharging over the spillway. With high discharges the tailwater builds up rapidly causing the weir to become submerged. Downstream flooding normally will result because of runoff in excess of river capacity rather than a result of dam failure. Dam failure at low river flows could result in the loss of more than a few lives in the town of Williamsburg and downstream flooding due primarily to the failure.

AD-A109 156/0 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Bentleyville Dam (NDI ID Number PA-1096, DER ID Number 63-49), Ohio River Basin, Tributary North Branch Pigeon Creek, Washington County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 72p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The dam appears to be in poor condition. No maintenance program exists for the dam and the lack of maintenance has led to a general deterioration of the structure. An upstream shut-off exists for the 12 in. drainline, but the capability of the valve to operate is questionable. Wet areas were observed on the downstream slope of the dam. One area observed at the right abutment contact; and a second wet area was observed on the downstream slope adjacent to the right spillway wingwall, approximately 10 feet below the right crest. The seepage should be investigated to ascertain its effects on the stability of the structure. The spillway is in a deteriorating condition and the concrete in the channel walls and channel bottom should be repaired. Undercutting of the channel floor if left unchecked could lead to the potential failure of the spillway structure. Brush and small trees were observed on the upstream and downstream slope. The brush and small trees should be removed in a controlled manner. (Author)

AD-A109 157/8 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Pond Number 4 Dam (NDI Number PA 00851, Penn DER Number 32-81), Ohio River Basin, Yellow Creek, Indiana County, Pennsylvania. Phase I Inspection Report,
James D. Hainley, and Timothy E. Debes. Jul 81, 64p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Pond No. 4 Dam is classified as a 'small' size, 'significant' hazard dam, with a recommended 1/2 PMF (Probable Maximum Flood) spillway design flood. Based on the review and evaluation of available design information and visual observations of conditions as they existed on the dates of the field reconnaissances, the general condition of Pond No. 4 Dam is assessed poor. This evaluation is specifically based on a steep upstream embankment slope, sparse vegetation cover on the crest and upstream slope, and minor slope distress and tree and woody shrub growth on the downstream embankment. Seeps located along the downstream embankment toe also represent a potential hazard and warrant periodic observation by the dam owner. In addition, the unprotected spillway channel bottom and sideslopes may also present hazard to the dam during large spillway discharges. Analysis using the HEC-1 Dam Safety version computer program indicated the spillway channel section can pass the recommended 1/2 PMF spillway design flood without overtopping the embankment crest. Spillway discharge capacity is therefore considered adequate. (Author)

AD-A109 158/6 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Trax Farm Dam (NDI Number PA 00131, PennDer Number 63-96) Ohio River Basin, Tributary to Peters Creek. Washington County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 72p
Contract DACW31-81-C-0027
Prepared in cooperation with Geo Systems, Inc., Pittsburgh, PA. Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Trax Farm Dam is located across an unnamed tributary to Peters Creek in Peters Township, Washington County, Pennsylvania, approximately 2.5 miles northwest of Finleyville, Pennsulvania. Trax Farm Dam was constructed to provide a water supply for irrigation. Based upon the observed height of the dam and downstream floodplain conditions, Trax Farm Dam was assigned a 'high' hazard potential rating.

AD-A109 159/4 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Mine Number 51 - Pond 3 (NDI Number PA 00863, PennDER Number 63-94) Ohio River Basin Tributary to Pigeon Creek, Washington County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 73p
Contract DACW31-81-C-0027
Prepared in cooperation with GEO Systems, Inc., Pittsburgh, PA.

Mine No. 51 - Pond 3 is located at the headwaters of an unnamed tributary to Pigeon Creek in Somerset Township, Washington County, Pennsylvania. The pond is approximately 1/2 mile north of Ellsworth, Pennsylvania. Mine No. 51 - Pond 3 was constructed to serve as a holding and settling impoundment for fine coal refuse slurry from the Mine No. 51 Coal Preparation Plant. Based on the observed downstream conditions, Mine No. 51 - Pond 3 was assigned a high hazard potential rating.

AD-A109 160/2 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Renton Slurry Pond 3 (NDI Number PA 00838, Penn DER Number 2-50), Ohio River Basin, Tributary to Little Plum Creek, Allegheny County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James Ellsworth Barrick, II. Jul 81, 68p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a review of available information, visual observations of conditions as they existed on the date of the field inspections, and supporting engineering calculations, the general condition of the Pond 3 is considered to be fair. This assessment is based primarily on visual observations of embankment, spillway and seepage conditions and hydrology/hydraulic analyses of reservoir/spillway capacity. The structure is classified as a 'small' size, 'high' hazard dam. Corps of Engineers guidelines recommend 0.5 to one times the Probable Maximum Flood (PMF) as the Spillway Design Flood for a 'small' size, 'high' hazard dam. The Pond 3's Spillway Design Flood is the Probable Maximum Flood because of its height. Spillway capacity is 'inadequate' because the nonovertopping flood discharge was found, by using the HEC-1 computer program, to be 35 percent of the PMF. At 0.5 PMF, the embankment overtopping depth and duration would be 0.58 feet and eight hours and 40 minutes respectively. In the opinion of the evaluating engineer, this overtopping depth and duration would not cause a catastrophic failure of the embankment.

AD-A109 161/0 PC **A05**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Labelle Slurry Pond 3 (NDI Number PA 00295, Penn DER Number 26-105), Ohio River Basin, Tributary to Monongahela River, Fayette County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James Ellsworth Barrick, II . Jul 81, 86p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a review of available information, visual observations of conditions as they existed on the date of the field inspections, and supporting engineering calculations, the general condition of LaBelle Slurry Pond 3 is considered to be fair. This assessment is based primarily on visual observations of embankment and spillway conditions and hydrology/hydraulic analyses of reservoir/spillway capacity. The structure is classified as a 'large' size, 'significant' hazard dam. Corps of Engineers guidelines recommend the Probable Maximum Flood (PMF) as the Spillway Design Flood for a 'large' size, 'significant' hazard dam. LaBelle Slurry Pond 3's Spillway Design Flood is the Probable Maximum Flood. Spillway capacity is 'inadequate' because the non-overtopping flood discharge was found, by using the HEC-1 computer program, to be 79 percent of the PMF. The Phase I investigation of LaBelle Slurry Pond 3 revealed deficiencies and conditions which should be corrected or improved through implementation of the following recommended improvement efforts. Recommendations are: (1) Embankment Improvements; (2) Principal Spillway: The owner should immediately clean the principal Spillway trash cage of debris and improve the inflow channel to permit unrestricted flow from the reservoir to the pipe; (3) Emergency Spillway: The emergency spillway should either be improved or eliminated; (4) Emergency Operation and Warning Plan; (5) Monitoring of Seepage Zones; and (6) Maintenance and Inspection Procedures.

AD-A109 162/8 PC **A05**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Robena Slurry Pond 6 (NDI Number PA 00197, Penn DER Number 30-26), Ohio River Basin, Tributary to Whiteley Creek, Greene County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 87p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a review of available design information, visual observations of conditions as they existed on the date of the field inspection, and supporting calculations, the general condition of Robena Slurry Pond 6 is considered to be good. The structure is classified as a 'large' size, 'significant' hazard dam. Corps of Engineers guidelines recommend the Probable Maximum Flood (PMF) as the spillway Design Flood for a 'large' size, 'significant' hazard dam. Robena Slurry Pond 6's Spillway Design Flood is the Probable Maximum Flood. Spillway capacity is 'adequate' because the non-overtopping flood discharge was found, by using the HEC-1 computer program, to be in excess of 100 percent of the PMF. No emergency operation and warning plan was found for the facility. The field inspection indicated very minor deficiencies which can be corrected or improved as a part of normal maintenance efforts.

AD-A109 163/6 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Russellton Slurry Pond 3 (NDI Number PA 00839, Penn DER Number 2-52), Ohio River Basin, Tributary to Little Deer Creek, Allegheny County, Pennsylvania. Phase I Inspection Report,
Samuel G. Mazzella, James P. Hannan, and James E. Barrick. Jul 81, 73p
Contract DACW31-81-C-0027
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a review of available information, visual observations of conditions as they existed on the date of the field inspection, and supporting engineering calculations, the general condition of the Russellton Slurry Pond 3 is considered to be fair. This assessment is based primarily on visual observations of the embankment, spillway and seepage conditions and hydrology/hydraulic analyses of reservoir/spillway capacity. The structure is classified as a 'large' size, 'high' hazard structure. Corps of Engineers guidelines recommend the Probable Maximum Flood (PMF) as the Spillway Design Flood for a 'large' size, 'high' hazard dam. Pond 3's Spillway Design Flood is the Probable Maximum Flood. Spillway capacity is 'adequate' because the non-overtopping flood discharge was found, by using the HEC-1 computer program, to be in excess of 100 percent of the PMF. The Phase I investigation of Pond 3 revealed deficiencies and conditions which should be corrected or improved through implementation of the following recommended remedial, monitoring and/or improvement efforts.

AD-A109 164/4 PC **A04**/MF **A01**
Kimball (L. Robert) and Associates, Ebensburg, PA.
National Dam Inspection Program. Patsy's Lake Dam (NDI ID Number PA-565, DER ID Number 26-5), Ohio River Basin, Tributary Saltlick Run, Fayette County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball. Jun 81, 72p
Contract DACW31-81-C-0012
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The assessment of Patsy's Lake Dam is based upon visual observations made at the time of inspection, hydraulic and hydrologic computations and past operational performance. The Patsy's Lake Dam appears to be in poor condition. The entire downstream slope of the dam is heavily vegetated. A portion of the downstream slope had been cleared, as observed during the May 12, 1981 inspection. The brush and small trees area being cut by the owner in an uncontrolled manner. The potential for erosion of the downstream slope of the dam exists. Potential erosion exists due to occassional pumping of reservoir water to supply water to a coal cleaning plant located near the dam. The water supply line has broken in the past, causing significant erosion to the downstream slope. A wet area was observed near the left abutment of the dam. It appeared as though the wet area was due to surface runoff from the left abutment. Dense vegetation exists in the spillway discharge channel. The dense vegetation could retard flow in the channel. The Patsy's Lake Dam is a high hazard-small size dam. The recommended Spillway Design Flood (SDF) for a dam of this size and classification, is in the range of 1/2 PMF to PMF. Based on the downstream potential for loss of life, the spillway design flood has been selected as the PMF. The spillway and reservoir are capable of controlling approximately 12% of the PMF, without overtopping the embankment low spot. Based on criteria established by the Corps of Engineers, the spillway is termed seriously inadequate. Patsy's Lake Dam is classified as an unsafe, non-emergency structure.

AD-A109 165/1 PC **A04**/MF **A01**
O'Brien and Gere Engineers, Inc., Philadelphia, PA.
National Dam Inspection Program. Sincavage Lumber Company Dam (Lake Sinca Dam), (NDI ID PA 00604, PA DER 45-238), Delaware River Basin, Unnamed Tributary of Two Mile Run, Monroe County, Pennsylvania. Phase I Inspection Report,
John J. Williams. Aug 81, 69p
Contract DACW31-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The Dam is a 23.5-foot high, 1,100-foot long earth embankment, constructed in 1969 to impound water for recreational use. The dam has an average crest width of 14 feet and a typical downstream slope of 2.5H:1V. The upstream face of the dam slopes at approximately 3H:1V and is protected with random size loose riprap. The principal spillway, including the low level outlet system, is located near the center of the dam and consists of a 4-foot square drop inlet structure, an 18-inch square low level sluice gate, and a 30-inch diameter corrugated metal pipe, which conveys discharge from the intake structure to the principal spillway discharge channel. A 75-foot wide emergency spillway is located at the northeastern dam abutment. Based upon the visual inspection of the dam and review of the drawings, the dam is considered to be in poor condition.

AD-A109 206/3 PC **A05**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Rosner Pond Dam (NDI ID Number PA-01111, DER ID Number 64-190), Delaware River Basin, Tributary to West Branch Lackawaxen River, Wayne County, Pennsylvania. Phase I Inspection Report.
Jun 81, 76p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The visual inspection and review of available data indicate that Rosner Pond Dam is in poor condition. The lack of a spillway and the poor condition of the outlet works are the primary deficiencies which cause concern for the safety of this facility. In accordance with the recommended guidelines, the spillway design flood (SDF) for this facility is in the range of 1/2 PMF to full PMF. Based on the size of the dam and degree of Downstream hazard, the selected SDF is the 1/2 PMF. The hydrologic and hydraulic computations indicate that the combination of reservoir storage and outlet works discharge capacity will not pass the SDF (1/2 PMF) prior to overtopping the embankment. Under present conditions, the discharge/storage capacity is 11% of the PMF prior to overtopping. In accordance with the criteria outlined and evaluated in the discharge capacity for Rosner Pond Dam is considered to be seriously inadequate. The dam in its present condition is considered to be unsafe, non-emergency.

AD-A109 207/1 PC **A05**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.

National Dam Inspection Program. Kellow Lake Dam (NDI ID Number PA-01105, DER ID Number 64-63), Delaware River Basin, Tributary to Carley Brook, Wayne County, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 77p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on available records, visual inspection, calculations, and past performance, Kellow Lake Dam is judged to be in fair condition. The recommended Spillway Design Flood (SDF) for the size and hazard classification of the dam varies between 1/2 of the Probable Maximum Flood (PMF) and the PMF. Based on the downstream conditions, the 1/2 PMF is selected as the SDF. Under existing conditions the spillway will pass only about 22 percent of the PMF. If all stoplogs were removed from the spillway, the spillway would pass about 51 percent of the PMF. The spillway capacity is rated as adequate provided that all stoplogs are removed. Potential stability problems exist for the dam. A slope failure occurred over one reach at an unknown time in the past. Although the damage in that reach does not appear to be serious, a similar failure could occur in a more critical area and threaten the overall stability of the dam. In addition, steel beams that support the roof of the spillway outlet channel are badly corroded and create a hazardous condition. Although some maintenance has been performed, the program should be expanded to correct all deficiencies.

AD-A109 208/9 PC **A05**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.
National Dam Inspection Program. Pocono Highland Dam (NDI ID Number PA-00992, DER ID Number 45-131), Delaware River Basin, Spring Run, Monroe County, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 77p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the criteria established for these studies, Pocono Highland Dam is judged to be unsafe, nonemergency, because the spillway capacity is seriously inadequate. The recommended Spillway Design Flood (SDF) for the size and hazard classification of the dam varies between 1/2 of the Probable Maximum Flood (PMF) and the PMF. The selected SDF is the 1/2 PMF. The existing spillway will pass only about 6 percent of the PMF before overtopping of the dam occurs. It is judged that the dam could not withstand the depth and duration of overtopping that would occur for the 1/2 PMF. If the low areas on the top of the dam were filled to the design elevation, the spillway would pass about 11 percent of the PMF without any overtopping. For either condition, the spillway capacity is rated as seriously inadequate. Failure of Pocono Highland Dam would cause an increased hazard for loss of life downstream.

AD-A109 209/7 PC **A05**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.
National Dam Inspection Program. Elk Lake Dam (NDI ID Number PA-01102, DER ID Number 64-4), Delaware River Basin, Elk Lake Run, Wayne County, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 76p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on the criteria established for these studies, Elk Lake Dam is judged to be in fair condition. The recommended Spillway Design Flood (SDF) for the size and hazard classification of the dam is the Probable Maximum Flood (PMF). The existing spillway will pass about 84 percent of the PMF before overtopping of the dam occurs. The spillway capacity is rated as inadequate. Several deficiencies were observed at the dam. The most serious is the probable lack of an adequate impervious barrier through the dam. Although some maintenance has been performed, the existing maintenance program could be upgraded. The following remedial measures, listed in approximate order of priority, are recommended to be undertaken by the Owner without delay: (1) Clear brush and debris on and adjacent to the dam. (2) Engage the services of a professional engineer experienced in the design and construction of dams. Utilize his advice in removing the trees on and near the embankment. If any seepage becomes evident after the brush, trees, and debris are removed, the condition should be assessed by the engineer. (3) Fill the slots by the spillway bridge with concrete or other suitable impervious material. (4) Fill the burrowing animal hole adjacent to the spillway with suitable impervious material.

AD-A109 210/5 PC **A05**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.
National Dam Inspection Program. Larsen Dam (NDI ID Number PA-00367, DER ID Number 35-30), Delaware River Basin, Lehigh River, Lackawanna and Wayne Counties, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 86p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on visual inspection, available records, calculations, past operational performance, and according to criteria established for these studies, Larsen Dam is judged to be in fair condition. Based on the size and hazard classification of the dam, the Spillway Design Flood (SDF) at the dam varies between 1/2 the Probable Maximum Flood (PMF) and the PMF. Based on the downstream conditions, the selected SDF is the 1/2 PMF. Under existing conditions, the spillway will pass about 12 percent of the PMF without overtopping of the dam. If the low areas on the top of the dam were filled to the design elevation, the spillway would pass 16 percent of the PMF. It is judged that Larsen Dam could not withstand the depth and duration of overtopping that would occur during the 1/2 PMF. However, it is judged that a high hazard dam located immediately downstream would fail due to overtopping prior to the overtopping failure of Larsen Dam. Therefore, the spillway capacity of Larsen Dam is rated as inadequate. No immediate stability problems were evident at the time of the inspection, but deficiencies do exist that could eventually affect the stability of the dam and appurtenances if they are not corrected.

AD-A109 211/3 PC **A05**/MF **A01**
Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA.
National Dam Inspection Program. Craft Pond Dam (NDI ID Number PA-01103, DER ID Number 64-27), Delaware River Basin, Branch of Lakeville Creek, Wayne County, Pennsylvania. Phase I Inspection Report,
Frederick Futchko. Jul 81, 81p
Contract DACW31-81-C-0018
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on available records, visual inspection, calculations, and past operational performance, Craft Pond Dam is judged to be unsafe, nonemergency, because the spillway capacity is rated as seriously inadequate. The recommended Spillway Design Flood (SDF) for the size and hazard classification of the dam varies between 1/2 of the Probable Maximum Flood (PMF) and the PMF. The selected SDF is the 1/2 PMF. The existing spillway will pass only about 23 percent of the Probable Maximum Flood (PMF) before overtopping of the dam occurs. It is judged that the dam could not withstand the depth and duration of overtopping that would occur for the 1/2 PMF. Failure of the dam would cause an increased hazard for loss of life downstream. Overall, the dam is in good condition. The maintenance of the dam is considered to be good; only a few minor maintenance deficiencies were observed. The other deficiencies observed were low spillway walls and an inoperable outlet works.

AD-A109 212/1 PC **A06**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Lake Greeley Dam (NDI I.D. Number PA-00752, PennDER I.D. Number 52-20), Delaware River Basin, Taylortown Creek, Pike County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 105p
Contract DACW31-81-C-0015
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a visual inspection, operational history, and hydroiogic and hydraulic analysis, the dam is considered to be in fair condition. The size classification of the facility is small and its hazard classification is considered to be high. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility ranges between the 1/2 PMF (Probable Maximum Flood) and the PMF. Since the facility is classified near the upper bounds of the small category with regard to available storage capacity, the SDF is considered to be the PMF. Results of the hydrologic and hydraulic analysis indicate that under existing conditions the facility will pass and/or store only about 17 percent of the PMF prior to embankment overtopping at the low area adjacent the left abutment. If the low area were regraded to the design top of dam, the spillway system would then pass about 28 percent of the PMF prior to embankment overtopping. Under existing conditions, spillway discharges are controlled by the existence of a township-owned roadway embankment and culvert that is situated about 100 feet downstream of the spillway weir.

AD-A109 213/9 PC **A04**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Long Ridge Dam (NDI I.D. Number PA-01022, PennDER I.D. Number 52-185), Delaware River Basin, Branch of Hornbecks Creek, Pike County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 69p
Contract DACW31-81-C-0015
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a visual inspection, operational history and hydrologic/hydraulic anlaysis, the dam is considered to be in fair condition. The size classification of the facility is small and the hazard classification is considered to be high. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) ranges between the 1/2 PMF (Probable Maximum Flood) and the PMF. Since the facility is classified near the lower bounds of the small category, the SDF is considered to be the 1/2 PMF. Results of the hydrologic and hydraulic analysis indicate the facility is capable of accommodating a 1/2 PMF event. Specifically, the facility will pass and/or store about 65 percent of the PMF prior to embankment overtopping. Consequently, the spillway is considered hydraulically adequate. It is noted that the spillway, as constructed, is considered to be deficient. The evaluation of its hydraulic adequacy is based upon the assumption that the channel adequately protected against erosion such that its service cannot threaten the structural integrity of the embankment.

AD-A109 214/7 PC **A05**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Sunrise Lake Dam (NDI I.D. Number PA-01091, PennDER I.D. Number 52-175), Delaware River Basin, Poison Brook, Pike County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 88p
Contract DACW31-81-C-0015
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a visual inspection, operational history, and hydrologic and hydraulic analysis, the dam is considered to be in good condition. The size classification of the facility is small and its hazard classification is considered to be significant. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility ranges between the 100-year frequency flood and the 1/2 PMF (Probable Maximum Flood). Since the facility is classified near the upper bounds of the small category, the SDF is considered to be the 1/2 PMF. Results of the hydrologic and hydraulic analysis indicate the facility is not capable of passing and/or storing the inflow resulting from a 1/2 PMF event without overtopping the emergency spillway dike. It must be noted, however, that the facility was found to be capable of accommodating the peak inflow from the 100-year frequency flood without overtopping. Nevertheless, the spillway system at Sunrise Lake Dam is considered to be inadequate.

AD-A109 215/4 PC **A04**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Lake Florence Dam (NDI I.D. Number PA-01092, PennDER I.D. Number 64-207), Delaware River Basin, Red Shale Brook, Wayne County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 63p
Contract DACW31-81-C-0015

Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a visual inspection, operational history, and hydrologic/hydraulic analysis, the dam is considered to be in fair condition. The size classification of the facility is small and the hazard classification is considered to be significant. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility ranges between the 100-year frequency flood and the 1/2 PMF (Probable Maximum Flood). Since the facility is classified near the lower bounds of the small category, the SDF is considered to be the 100-year frequency flood. Results of the hydrologic and hydraulic analysis indicate the facility is not capable of passing the inflow resulting from a 100-year frequency flood without overtopping the embankment. Consequently, the spillway system at Lake Florence Dam is considered to be inadequate.

AD-A109 216/2 PC **A04**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Unger Dam (NDI ID Number PA-01090, PennDer ID Number 64-208), Delaware River Basin, Red Shale Brook, Wayne County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 56p
Contract DACW31-81-C-0015
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Based on a visual inspection, operational history, and hydrologic and hydraulic analysis, the dam is considered to be in good condition. The size classification of the facility is small and its hazard classification is considered to be significant. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility ranges between the 100-year frequency flood and the 1/2 PMF (Probable Maximum Flood). Since the facility is classified near the lower bounds of the small category, the SDF is considered to be the 100-year frequency flood. Results of the hydrologic and hydraulic analysis indicate the facility is not capable of passing the inflow resulting from a 100-year frequency flood without overtopping the embankment. Consequently, the spillway at Unger Dam is considered to be inadequate.

AD-A109 217/0 PC **A04**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Ross Dam (NDI ID Number PA-00978, DER ID Number 58-134) Susquehanna River Basin, East Branch Tunkhannock Creek, Susquehanna, County, Pennsylvania. Phase I Inspection Report.
Jun 81, 69p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The visual inspection and review of available design and construction data indicate that Ross Dam is in fair condition. The deteriorated condition of the spillway ways and the adjacent low areas of the embankment are the primary deficiencies which require maintenance work to assure the operational safety of this facility. In accordance with the recommended guidelines, the spillway design flood (SDF) for this facility is in the range of the 100 year flood to the 1/2 PMF. Based on the size of this dam and the degree of downstream hazard, the selected SDF is the 100 year flood. The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity will pass the SDF (100 year flood) prior to overtopping the embankment. Therefore, in accordance with the criteria outlined and evaluated in Section 5.5 of this report, the spillway for Ross Dam is considered to be adequate.

AD-A109 218/8 PC **A04**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Duck Pond Dam (NDI ID Number PA-00379, DER ID Number 35-98), Susquehanna River Basin, Tributary to South Branch Tunkhannock Creek, Lackawanna County, Pennsylvania. Phase I Inspection Report.
Rept. for 5 Nov 80-26 Mar 81,
James W. Peck. Jun 81, 66p
Original contains color plates: All DTIC/NTIS reproductions will be in black and white.

The visual inspection and review of available data indicate that Duck Pond Dam is in fair condition. The lack of embankment protection from spillway flows and the inadequate spillway capacity are the primary deficiencies which cause concern for the safety of this dam. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for this facility is in the range of the 100 year flood to 1/2 the Probable Maximum Flood (PMF). Based on the size of the dam and degree of downstream hazard, the selected SDF is the 100 year flood. The hydrologic and hydraulic computations indicate that the combination of reservoir storage and outlet works discharge capacity will not pass the SDF (100 year flood) prior to overtopping the embankment. In accordance with the criteria outlined and evaluated in Section 5.5 of this report, the discharge capacity for Duck Pond Dam is considered to be inadequate.

AD-A109 219/6 PC **A04**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Interlaken Dam (NDI ID Number PA-01037, DER ID Number 35-087), Susquehanna River Basin, Tributary to Summit Lake Creek, Lackawanna County, Pennsylvania. Phase I Inspection Report,
William P. Kelly. Jun 81, 65p
Original contains color plates: All DTIC/NTIS reproductions will be in black and white.

The Visual inspection and review of available design and construction data indicate that Interlaken Dam is in poor condition. The deteriorated condition of the spillway, the inadequate spillway capacity and the adjacent breached and low areas of the embankment are the primary deficiencies which cause concern for the safety of this facility. In accordance with the recommended guidelines, the spillway design flood (SDF) for this facility is in the range of the 100 year flood to 1/2 the Probable Maximum Flood (PMF). Based on the size of the dam and degree of downstream hazard, the selected SDF is the 100 year flood. The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity will not pass the SDF (100 year flood) prior to overtopping the embankment. In accordance with the criteria outlined and evaluated in Section 5.5, the spillway for Interlaken Dam is considered to be inadequate. (Author)

AD-A109 220/4 PC **A05**/MF **A01**
GAI Consultants, Inc., Monroeville, PA.
National Dam Inspection Program. Heritage Reservation Dam (NDI I.D. Number PA-01142, PennDER I.D. Number 26-101), Ohio River Basin, Little Sandy Creek, Fayette County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Sep 81, 82p
Contract DACW31-81-C-0015
Original contains color plates: All DTIC/NTIS reproductions will be in black and white.

Based on a visual inspection, operational history, and available engineering data, Heritage Reservation Dam is considered to be in excellent condition. The size classification of the facility is intermediate and the hazard classification is considered to be high. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) is considered to be the PMF (Probable Maximum Flood). Results of the hydrologic and hydraulic analysis indicate that the facility is capable of passing and/or storing the PMF without overtopping the dam or dike. Consequently, the spillway is considered adequate.

AD-A109 221/2 PC **A05**/MF **A01**
Army Engineer District, Rock Island, IL.
South Branch Kishwaukee River Near: DeKalb County, Illinois.
Final rept.,
Pete A. Raven, and Lere Busch. Oct 81, 79p

Significant flooding problems exist along the East Branch of the South Branch of the Kishwaukee River. This study identified three alternative, nonstructural plans which warrant further study to alleviate the flood problems. However, the DeKalb County Board of Supervisors rescinded their local cooperation agreement because of the high non-Federal costs. Further Federal action has been terminated. (Author)

AD-A109 253/5 PC **A04**/MF **A01**
Army Engineer District, Baltimore, MD.
National Dam Inspection Program. Lake Irena Dam (NDI ID Number PA-00179, DER ID Number 40-215), Susquehanna River Basin, Tributary to Black Creek, Luzerne County, Pennsylvania. Phase I Inspection Report,
James W. Peck. Sep 81, 66p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The visual inspection and review of available design and construction data indicate that Lake Irena Dam is in fair condition. In accordance with the guidance provided, the spillway design flood (SDF) ranges between the 100 year flood and 1/2 the PMF. Based on the size and extent of downstream hazard for the dam, the SDF selected for this facility was the 100 year flood. The hydrologic and hydraulic computations indicate that the spillway will pass the selected SDF prior to overtopping the embankment. Therefore, in accordance with the recommended criteria for Phase I inspections, the spillway for Lake Irena Dam is considered to be adequate. (Author)

AD-A109 254/3 PC **A05**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Reservoir Number 7 Dam (NDI ID Number PA 00090, DER ID Number 64-1), Susquehanna River Basin, Racket Brook, Wayne County, Pennsylvania. Phase I Inspection Report.
Sep 81, 78p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Reservoir No. 7 Dam is an earthfill structure approximately 12.9 feet high and 300 feet in length (including spillway). The 30 foot wide spillway is an uncontrolled sharp-crested concrete weir located near the right abutment of the dam. The dam is located in Canaan Township, Wayne County, Pennsylvania, and is used for water supply. The deficiencies noted during this inspection are basically maintenance related. The operational condition of the sluice gate and valve on the outlet works conduit should be determined and repairs made. The upstream gate should be closed and the downstream valve left open to prevent pressure within the pipe. The discharge end of the conduit should be cleared of obstructions. The deterioration of the spillway wingwalls and discharge channel walls should be repaired. All debris should be removed from in front of the weir, as well as with all trees in the discharge channel immediately below the concrete chute.

AD-A109 255/0 PC **A05**/MF **A01**
Corps of Engineers, Baltimore, MD. Baltimore District.
National Dam Inspection Program. Longford Lake Dam (NDI ID Number PA-00898, DER ID Number 58-137), Susquehanna River Basin, Tributary to Choconut Creek, Susquehanna County, Pennsylvania. Phase I Inspection Report.
Sep 81, 79p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The visual inspection and review of available design and construction data indicate that Longford Lake Dam is in good condition. In accordance with the guidance provided, the spillway design flood (SDF) ranges between 1/2 the PMF and the full PMF. Based on the size and extent of downstream hazard for the dam, the SDF selected for this facility was the PMF. The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity will pass 88% of the PMF prior to overtopping the embankment. Therefore, in accordance with the recommended criteria for Phase I inspections, the spillway for Longford Lake Dam is considered to be inadequate.

AD-A109 256/8 PC **A04**/MF **A01**
Ackenheil and Associates Geo Systems, Inc., Pittsburgh, PA.
National Dam Inspection Program. Contee Main Settling Pond Dam (NDI I.D. Number MD 81), Potomac River Basin, Indian Creek, Prince Georges County, Maryland. Phase I Inspection Report,
James D. Hainley, and Paul A. D'Amato. Jul 81, 74p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon visual observations and review of available data. Detailed investigations and analyses involving topographic mapping, subsurface investigations, materials testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify the need for such studies which

should be performed by the owner. In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detected if inspected under the normal operating environment of the structure.

AD-A109 268/3 PC **A04**/MF **A01**
Army Engineer District, Baltimore, MD.
National Dam Inspection Program. Kehley Run Dam Number 6 (NDI ID Number PA-01019, DER ID Number 54-20), Susquehanna River Basin, Kehley Run, Schuylkill County, Pennsylvania. Phase I Inspection Report,
James W. Peck. Jun 81, 69p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Bedrock at Kehley Run Dam No. 6 is the Schuykill member of the Pottsville Formation, which is conglomerate, conglomeratic sandstone and sandstone with minor shale interbeds. It is generally a hard resistant rock unit. Stratigraphically above the Pottsville, the Llewellyn Formation comprises the core of the synclinal fold. It is sandstone, conglomerative sandstone and shale with numerous mineable coals. The Lykens Valley No. 3 coal is near the base of the Schuykill Member and beneath that is the Lyken Valley No. 2 coal neither of which appear to have been mined beneath the reservoir. According to PennDER, Bureau of Topographic and Geologic Survey, areas adjacent to the reservoir on the northeast and southwest have been strip mined. No signs of strip mining were found close enough to the dam or reservoir to be considered a potential hazard. (Author)

AD-A109 336/8 PC **A06**/MF **A01**
Corps of Engineers, Seattle, WA. Seattle District.
Puyallup River Project Resource Use Plan,
Paul Forsander, Joanne Wright, and Julie Schickling.
Aug 80, 116p

The purpose of this report is to identify resources, define objectives, and formulate a plan for long range use of the resources of the Corps of Engineers' Puyallup River Flood Control Project. Located along the Puyallup River between the East 11th Street Bridge, to the city limits of Tacoma, it was authorized by Congress in 1936 and completed in 1950. The project included channelization and stabilization of the river banks, and the construction and maintenance of levees to give protection to the Tacoma industrial area. In addition to looking at the Corps of Engineers' Project, this report discusses the area surrounding the Project to establish a context for resource use planning. Thus, the portion of the river between Commencement Bay and the City of Sumner is identified as the 'study area.' This report is the first phase of a two phase planning study for the Puyallup River's resources. The first phase inventoried existing conditions, analyzed resource capabilities and formulated a Resource Use Plan. Based upon this analysis, the Corps of Engineers and the local jurisdictions will decide upon the feasibility of proceeding with the second phase of resource planning. The Corps of Engineers is prepared to undertake the second planning phase if there is an expression of interest from local governmental bodies in participating in the resource development of Puyallup River.

AD-A109 365/7 PC **A08**/MF **A01**
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.
Nitrification Enhancement through pH Control with Rotating Biological Contactors.
Final rept. 1 Aug 79-31 Jul 81,
James M. Stratta, and David A. Long. Sep 81, 167p
Contract DAMD17-79-C-9110
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The short and long term effect of pH on the nitrification of domestic wastewater with pilot scale Rotating Biological Contactors (RBC) systems are examined. Alternative alkaline chemicals are evaluated for their ability to enhance the nitrification rate. Findings demonstrate greater nitrification rates at elevated pH levels and similar nitrification rates for various alkaline chemicals. Lime usage increases suspended solids which results in a need for additional settling prior to discharge. Design recommendations are included.

AD-A109 378/0 PC **A25**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Phase I General Design Memorandum with Environmental Impact Statement. A Harbor for Light-Draft Vessels at Cross Village, Michigan.
Jul 81, 584p
Includes Environmental Impact Statement.

A harbor for light-draft vessels is recommended for construction at Cross Village, Michigan, to facilitate the areas' recreational boating demand, provide docking for commercial fishing and transportation interests, and serve as a mainland harbor of refuge. Authorization for construction was granted on 7 November 1966, in the River and Harbor Act of 1966 (Public Law 89-789). The project would consist of (1) construction of two rubblemound breakwaters; (2) dredging of an entrance channel, inner access channel, and anchorage area; (3) removal of the deteriorated 1939 breakwater; (4) construction of an underwater fish habitat; (5) swimming beach extension; and (6) shoreline dredged material disposal. Construction operations would result in some minor degradation in noise, air, water, and aesthetic quality in the vicinity of the harbor. Representatives of three State of Michigan threatened plant species would be destroyed and some of their dune habitat eliminated. Additional habitat in the form of rock faced rubblemound breakwaters and stone fish reefs would offer additional substrates for fish, algae, and benthic invertebrate production in the area.

AD-A109 379/8 PC **A99**/MF **A01**
Moffatt and Nichol, Inc., Long Beach, CA.
Low - Cost Shore Protection. Final Report on the Shoreline Erosion Control Demonstration Program (Section 54) 1981.
Aug 81, 835p
Contract DACW72-79-R-0009

This report documents the results of a program conducted by the U.S. Army Corps of Engineers to develop and demonstrate low-cost methods of shore protection in accordance with the provisions of Section 54, Public Law 93-251, 93d Congress, approved March 7, 1974. The program objectives were to provide a data base for use in the logical selection of devices or combination of devices to protect inland or sheltered shorelines in any region of the United States, and to develop techniques for making such a selection. Topics covered include breakwaters, bulkheads, groins, revetments, seawalls, sills and vegetation.

AD-A109 391/3 PC **A08**/MF **A01**
Shapiro and Associates, Inc., Seattle, WA.
Snohomish Estuary Wetlands Study. Volume I. Summary Report,
Andrew L. Driscoll. May 79, 173p
Contract DACW67-77-C-0103
See also Volume 3, AD-A109 338.

This study provides a basis for the environmental evaluation of public interest factors and a factual body of physical, biological, public policy, and land use information for the Snohomish estuary study area, to be used in the environmental evaluation and review of Corps Section 10 and Section 404 permit applications. Wetlands and areas of particular importance or concern in the study area are identified and described. A method for the assessment of the specific and cumulative impacts of proposed permit activities is presented. The study area includes the entire 100-year floodplain of the Snohomish River north of its confluence with Ebey Slough, Everett Harbor, the north shore of Possession Sound including Tulalip Bay and adjacent upland boundaries. Emphasis is on the floodplain and areas under Corps jurisdiction; the upland areas are included because activities there may influence wetlands and floodplain areas. The permit review process as carried out by the Seattle District is described.

DE82000486 PC **A12**/MF **A01**
Federal Energy Regulatory Commission, Washington, DC. Office of Pipeline and Producer Regulation.
Trans-Anadarko Pipeline Project: Draft Environmental Impact Statement.
Sep 81, 251p FERC/EIS-0030D

This draft environmental impact statement (DEIS) arises from an application for a certificate of public convenience and necessity authorizing the construction and operation of 635 miles of 36-inch diameter pipeline and appurtenant facilities between Moore County, Texas, and Ouachita Parish, Louisiana. As proposed, the facilities would be constructed in two phases. The DEIS assesses the environmental impact of the proposed project, recommended modifications to the proposed routing, and the feasibility of various alternatives including a system alternative. The environmental staff has examined the project's potential effects on soils, geology, water, land use, recreation, aesthetic qualities, air quality, noise levels, vegetation, wildlife, cultural resources, socioeconomics, and pipeline safety conditions. On the basis of information currently available, the environmental staff concludes that the construction and operation of the proposed project would have limited adverse environmental impact. However, further investigation of several system design or routing modifications which would reduce environmental impact is required, and several new concerns raised by the present investigation require that additional information be provided by Trans-Anadarko. The environmental staff also concludes pending further development of other considerations, that the Trailblazer Extension Alternative is environmentally superior and preferable to the proposed project. The staff recommends implementation of several mitigating measures as conditions to the certificate, should the Commission approve the project. (ERA citation 06:034304)

N82-14369/4 PC **A02**/MF **A01**
Prins Maurits Lab. TNO, Rijswijk (Netherlands).
Porous Polymers as New Sorptive Materials.
J. Medema, and J. J. G. M. Vanbokhoven. Oct 80, 18p PML-1980-77, TDCK-75001

Porous polymers are compared with active carbon for the adsorption of harmful compounds from the atmosphere. Factors determining the character of porous polymers are discussed, and results regarding adsorption capacity is described. Literature data and adsorption tests were used. The main factors which characterize the polymer are solvent type and degree of crosslinking. Active groups do not influence the physical adsorption capapcity very much. Water vapor adsorption on porous polymers is extremly low. The rate of adsorption on a good porous polymer is considerably lower than the rate of adsorption into active carbon.

N82-14551/7 PC **A08**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Dept. of Physics.
Water Aeration with Plunging Jets.
J. Vandedonk. 1981, 169p ISBN-90-6231-088-5

Application of plunging water jets to large scale aeration processes is studied. Entrainment measurements made with various nozzle types with diameters up to 10 centimeters are given. A hydrodynamic model in which the plunging jet is continued below the water surface in a conical form is described. The entrained air in this biphasic cone is broken up into fine bubbles. This model contains four parameters which describe: (1) the water entrainment by the jet, (2) the gas fraction of the recirculating fluid, (3) the liquid velocity at which bubbles escape from the cone and (4) the ratio between the width of the downflowing liquid velocity and gas fraction profiles. The oxygen transfer from the air bubbles into the water of the plunging jet aerator is studied as well as the influence of contaminants on the aeration constant. Two examples of practical application of the plunging water jet: an aeration basin for the treatment of waste water and a fermentor for the production of yeast are presented. These examples confirm that plunging jet aerators can achieve mass transfer efficiencies up to 2 kgO2/kWh using air in commercial scale applications.

N82-14672/1 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Application of a Gaussian Multilayer Diffusion Model to Characterize Dispersion of Vertical Hcl Column Density in Rocket Exhaust Clouds.
G. L. Pellett, and W. L. Staton. Dec 81, 74p NASA-TP-1956, L-14715

Solid rocket exhaust cloud dispersion cases, based on seven meteorological regimes for overland advection in the Cape Canaveral, Florida, area, are examined for launch vehicle environmental impacts. They include a space shuttle case and all seven meteorological cases for the Titan 3, which exhausts 60% less HC1. The C(HC1) decays are also compared with recent in cloud peak HC1 data from eight Titan 3 launches. It is stipulated that while good overall agreement provides validation of the model, its limitations are considerable

and a dynamics model is needed to handle local convective situations.

N82-14673/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Supplementary Analyses to the Study Carried out around Orly.
J. Francois. Sep 81, 43p NASA-TM-76627
Contract NASW-3542
Transl. Into English of "Repercussion du Bruit des Avions sur l'Equilibre des Reverains des Aeroports--Analyses Complementaires de l'Enquete Realisee Autour d'Orly" Aug. 1977 42 p. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Inst. Francais d'Opinion Publique, Paris.

The effects of aircraft noise on humans living near airports were studied. Two main questions were considered: do residents give evidence of psychological or physiological disturbances in unusually intense noise sectors; and do personality or health factors account for the high interindividual variability of annoyance. The methodology used and results obtained are presented. Samples of the survey questionnaires are included.

N82-14674/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Taking into Account Nighttime Annoyance in the Calculation of the Psophic Index.
J. Francois. May 81, 30p NASA-TM-76580
Contract NASW-3199
Transl. Into English of "La Prise en Compte de la Gene Nocturne dans le Calcul de l'Indice Psophique" Rept., France, Feb. 1977 p 1-33. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Inst. Francaise d'Opinion Publique (Ifop), Paris.

The annoyance factor caused by air traffic noise on the residents of areas near airports is discussed. The psophic index is used to predict the level of overall annoyance suffered on the average by residents around airports. The calculation method differentiates between daytime and nighttime annoyance.

N82-14682/0 PC **A08**/MF **A01**
Institut de Recherche des Transports, Arcueil (France).
Patterns of Behavior in Lodgings Subject to Traffic Noise.
J. Lambert, F. Simonnet, and M. Vallet. Sep 80, 165p IRT-47, ISBN-2-85782-075-5
In French; English Summary.

Threshold values at which public services should intervene to attenuate the noise nuisance are defined. Observations were made in the field of daily life at home. Data was collected on the use of lodgings, on effects of noise on health and sleep, and on the incidence of running away from home. A correlation was also made with the equipment and noise insulation of lodgings. The results show that above 65 dB in daytime, there are behavior patterns that are extreme so far as they modify in a considerable manner the way of life of people, living both in collective housing (apartments) and in individual houses.

N82-14693/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Studies on the Behavior of Ammonia and Ammonium Salts in the Atmosphere (1) - Fractional Collection of Ammonia Gas and Particulate Ammonium.
K. Kiin, M. Fujimura, and Y. Hashimoto. May 81, 10p NASA-TM-76582
Contract NASW-3199
Transl. Into English from the Journal of the Japan Soc. Of Air Pollution (Japan), V. 14, No. 10, 1979 p 30-33. Original Language Document Was Announced as A80-28118. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

Methods for the fractional collection of trace amounts of atmospheric ammonia gas and ammonium particles on a two staged glass fiber filter are summarized. A standard glass fiber filter washed with distilled water and dried at 120 to 130 C was used. A second filter was impregnated with a mixture of 3% boric acid and 25% glycerin solution. The blank of glass fiber filters impregnated with a mixture of the above solution was very low for ammonia, i.e. 0.06 micrograms in a filter of 47 mm in diameter. The mean concentrations of ammonia and ammonium in air at Kawasaki, a polluted area, were 7.6 and 2.3 micrograms cu m, and those at Sanriku, an unpolluted area 0.9 and 0.2 micrograms cu m, respectively. Ratios of concentration levels of ammonium to total ammonia in the atmosphere were 0.3 and 0.2 for the polluted and unpolluted areas, respectively. Ammonium salts in air at both areas were not correlated with relative humidity. Variations in time of ammonia concentrations and sources in surrounding areas are also considered.

PB82-138314 PC **A04**/MF **A01**
Kansas Governor's Task Force on Water Resources, Topeka.
Governor's Task Force on Water Resources, 1978.
Final rept.
1978, 72p NSF/RA-780892
Grant NSF-ISP77-25864

Groundwater management issues addressed cover expertise on water law, state assistance to groundwater management districts, pilot recharge, metering water use, and enforcement problems. Surface water recommendations adopted by the Task Force are discussed under the following headings (1) public access to streams; (2) minimum instream flows; (3) state technical assistance to local public water systems; (4) state financial assistance for certain flood control benefits; (5) rural water district paogram; and (6) state water storage and marketing program.

PB82-142134 PC **A09**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Prediction of the Hydraulic Jump Location Following a Change of Slope in a Partially Filled Drainage Pipe,
J. A. Swaffield. May 81, 193p NBSIR-81-2367
Sponsored in part by Department of Housing and Urban Development, Washington, DC. Office of Policy Development and Research. Prepared in cooperation with Brunel Univ., Uxbridge (England).

The criteria governing the formation of a hydraulic jump in a partially filled fluid conduit downstream of a slope change are presented together with the necessary techniques to enable water surface profiles and jump location to be predicted. Computer programs designed to model the conditions leading to jump formation under flow and channel scale conditions compatible with current drainage system design are presented. The results of a wide range of test conditions in terms of jump formation and position downstream of a change in channel slope are presented together with a set of criteria to be used in evaluating whether a jump will occur for a given set of design conditions.

PB82-143173 PC **A04**/MF **A01**
Minnesota Univ., Minneapolis.
Airborne Dust from Taconite Tailings.
Open file rept. 1 Sep 76-Feb 80,
D. H. Yardley, W. D. Lacabanne, and C. R. Nelson. Nov 80, 53p BUMINES-OFR-148-81
Contract J0265055

The objective of this report was to evaluate a variety of dust suppressants to determine their effectiveness in mitigating dust from taconite tailings. Field test plots were established on taconite tailings and wind tunnel laboratory tests were conducted. The tests consisted of comparing treated and untreated samples at wind velocities of 40 mph using a weight-loss method and direct dust emission measurements. It was shown that the emission of fine dust from taconite tailings in the 4.5- to 0.85-micrometer range could be reduced by 99 pct using certain chemical suppressants. It was also shown that a straight water spray on coarse tailings reduced dust emission by 95 pct. Although eight different chemicals were tested, most of the tests were made using Coherex, ammonium lignin sulfonate, and sodium silicate. These dust suppressants were used singly and in combination on almost 75 field test plots. The Coherex appears to provide the best results in terms of economics and durability. Wind tunnel tests on treated and untreated Cu-Ni tailings showed that applications of dust suppressants reduced fugitive fine dust by better than 99 pct.

PB82-143249 PC **A02**/MF **A01**
Environmental Monitoring Systems Lab., Las Vegas, NV.
Pollutant Monitoring in the Olympic National Park Biosphere Reserve.
Journal article,
Kenneth W. Brown. Dec 81, 13p EPA-600/J-80-039
Pub. in Environmental Monitoring and Assessment 1, p37-47 1981.

Interest in global contamination has been instrumental in the establishment of over 33 Biosphere Reserves in the United States. These reserves include pristine areas that have been protected from industrial development. They serve as areas in which present and future environmental pollution can be assessed. Pollutant monitoring studies are being conducted in the Olympic National Park Biosphere Reserve by the U.S. Park Service and the U.S. Environmental Protection Agency. Studies are designed to identify levels of trace element and organic contaminants in physical and biological media. Ten remote sites were selected for intensive sampling. These areas were located in the Hoh, Quinault, and Dosewallips River drainages; at Anderson and Grand Pass; near Ozette Lake and, at the northern edge of Blue Glacier. Their proximity to vehicle-traveled roads varied from 3 to 20 kilometers. Samples were taken in air, water, soil, litter and vegetation. Samples will be analyzed for organic and heavy metal contaminants. Airborne particulate size and chemical characterization is being investigated.

PB82-143314 PC **A02**/MF **A01**
Industrial Environmental Research Lab., Research Triangle Park, NC.
Particle Collection by a Pilot Plant Venturi Scrubber Downstream From a Pilot Plant Electrostatic Precipitator.
Journal article,
L. E. Sparks, G. H. Ramsey, and B. E. Daniel. 4 Feb 80, 10p EPA-600/J-81-320
Pub. in Atmospheric Environment, v15 p65-72 1981.

The paper gives results of pilot plant experiments of particulate collection by a venturi scrubber downstream from an electrostatic precipitator (ESP). The data, which cover a range of scrubber operating conditions and ESP efficiencies, show that particle collection by the venturi scurbber is not affected by the upstream ESP; i.e., for a given scrubber pressure drop, particle collection efficiency as a function of particle diameter is the same with the ESP both on and off. The experimental results are in excellent agreement with theoretical predictions. Order of magnitude cost estimates indicate that particle collection by ESP scrubber systems may be economically attractive when scrubbers must be used for SOx control.

PB82-143389 PC **A02**/MF **A01**
Radian Corp., Austin, TX.
Environmental Assessment and Control Technology for Low-Btu Gasification Works.
Journal article,
G. C. Page, W. J. Rhodes, and T. K. Janes. 1980, 12p EPA-600/J-80-364
Contract EPA-68-02-2147
Pub. in Coal Processing Technology, v6 p56-65 1980.

The paper shows how EPA's Environmental Assessment (EA) methodology can be used to: (1) screen gaseous, liquid, and solid waste streams for potentially harmful health and ecological effects (Level 1); (2) prioritize the waste streams and their components for detailed analyses (Level 2); and (3) apply these data to the selection and evaluation of control technologies. To do this, chemical and biological data, collected during an environmental test program at a commercial-size Chapman low-Btu gasifier were used. The paper concludes that: (1) results of the SAM/IA analysis and bioassay screening tests compared favorably in most cases (exceptions included the gasifier ash and separator liquor); (2) results of the SAM/IA analysis and bioassay screening tests can be used to prioritize waste streams and their components for detailed analyses (Level 2); and (3) results of the detailed analyses can be applied to the selection and evaluation of control technologies and to chemical parameters that need to be monitored in the control technology's waste streams for long-term health and ecological impact studies. Existing standards determine when a control technology is required and what pollutants need to be controlled.

PB82-143397 PC **A02**/MF **A01**
Washington Univ., Seattle.
Airborne Studies of the Emissions from the Volcanic Eruptions of Mount St. Helens.
Journal article,

Peter V. Hobbs, Lawrence F. Radke, Mark W. Eltgroth, and Dean A. Hegg. 1981, 6p EPA-600/J-81-421
Pub. in Science, v211 p816-818, 20 Feb 81.

The concentrations of particles less than 10 micrometers in diameter in the ash emissions from Mount St. Helens have been more than 1000 times greater than those in the ambient air. Mass loadings of particles less than 2 micrometers in diameter were generally several hundred micrograms per cubic meter. In the ash clouds, produced by the large eruption on 18 May 1980, the concentrations of several trace gases generally were low. In other emissions, significant, but variable, concentrations of sulfur gases were measured. The 18 May eruption produced nuees ardentes, lightning flashes, and volcanic hail.

PB82-146242 PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Washington, DC. Office of Coastal Zone Management.
Reviving the Urban Waterfront,
Andy Leon Harney. 1981, 50p NOAA-81110503
Prepared in cooperation with Partners for Livable Places and National Endowment for the Arts.

The Office of Coastal Zone Management has begun working with states through its grants programs to encourage the redevelopment of underutilized waterfronts for recreation, open space and economic development. The projects range from developing comprehensive plans to detailed architectural and engineering studies of waterfront areas. The seven projects described briefly in this publication are demonstrations of the important changes that can be brought about through imaginative reuses of urban waterfronts.

PB82-146291 PC **A02**/MF **A01**
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
The Michigan Shore Protection Demonstration Project: Wave Histories by Means of a Computer Program, Some Conclusions About Low-Cost Protection.
Final rept.,
Ernest F. Brater, and C. David Ponce-Campos. Aug 81, 23p MICHU-SG-81-203, NOAA-81100901

Field and laboratory investigations were used to evaluate low-cost shore protection methods. The primary effort during the final project year was to develop a history of wave action at the demonstration sites as a basis for evaluating the effectiveness and durability of the field installations. Because of the large number of wind storms requiring analysis for the various sites, a computer algorithm was developed for estimating wave heights from continuous hourly wind velocities and directions.

PB82-146309 PC **A07**/MF **A01**
California Univ., Riverside. Statewide Air Pollution Research Center.
Investigation of the Role of Natural Hydrocarbons in Photochemical Smog Formation in California.
Final rept. 19 Jun 79-18 Sep 80,
Arthur M. Winer, Dennis R. Fitz, Paul R. Miller, Edgar R. Stephens, and Frank R. Burleson. Mar 81, 127p ARB/R-81-152
Contract ARB-A8-135-31

Progress is decribed for the first year of a two-year program designed to obtain data necessary for assessing the potential contribution of natural organics to the formation of photocheimcal air pollution in the California South Coast Air Basin (CSCAB). Needed data include knowledge of emission rates, ambient concentrations and oxidant- and aerosol-forming potential of biogenic hydrocarbons as well as estimates of vegetative biomass in the CSCAB. During the initial year of this investigation, the following tasks were carried out: Oxidant-precursor relationships were determined for near-ambient concentrations of a-pinene based on data obtained with a 40,000-liter dual-mode outdoor irradiation chamber. Initial measurements were made of the ambient concentrations of natural hydrocarbons emitted by relevant vegetative communities in areas free of anthropogenic emissions. Plant enciosure chambers and analytical methods were developed for measuring the emission factors of isoprene and monoterpenes from natural, ornamental and agricultural vegetation in the 'source region' of the CSCAB. Studies were made of the feasibility of applying remote imagery techniques (including LANDSAT, U-2 and low altitude photography) to the task of quantifying the extent and mass of vegetation in the 'source region' of the CSCAB.

PB82-147265 PC **A08**/MF **A01**
National Research Council, Washington, DC.
On Prevention of Significant Deterioration of Air Quality.
Feb 81, 164p ISBN-0-309-03137-0
Library of Congress catalog card no. 81-80676.

The Clean Air Act Amendments of 1977 (PL 95-95, 91 Stat. 731) established a national program to prevent significant deterioration of air quality (PSD) where the air is relatively clean. The amendments also mandated two independent studies of the PSD provisions of the Act, one to be performed by the National Commission on Air Quality and one by the National Academy of Sciences. This report contains the findings, conclusions, and recommendations of the Academy's study.

PB82-147281 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Kenya-Sudan Road Link. A Socio-Economic Study, Report 3: The Turkana Road,
Inger Johanne Sundby. Jul 81, 45p ISBN-82-7133-370-4
See also Report No. 2, PB82-147273. Sponsored in part by Norwegian Agency for International Development, Oslo.

This report is part of a socio-economic impact study of the Kenya-Sudan road link from Lodwar to Juba. It deals with the background information drawn from the ongoing construction work between Kapenguria and Lodwar. Emphasis is laid on physical structure and social network in the camps along the construction sites.

PB82-147489 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
Oil Spill Clean-Up: An Economic and Regulatory Model,
John B. Bidwell. 1 Jul 81, 30p MITSG-81-6, OPPORTUNITY BRIEF-25, NOAA-81102111
Index No. 81-606-Smp.

The broadest objective of the report is to develop a model which will provide policy makers with a strategic tool to analyze options for response to accidental oil pollution under varying sets of assumptions. With it, it will be possible to calculate optimal configurations of cleanup resources in terms of locations, types and quantities of cleanup equipment that should be strategically stockpiled in response to estimates of long term needs. Well before actual need, companies operating in a region in which the model is being used will be able to gain a new, improved perspective on their role and responsibilities in the regional clean-up system.

PB82-148305 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
Measurement and Prediction of Vibration Response of Deepwater Offshore Structures,
Norman Doelling. 1 Jul 81, 25p MITSG-81-3, OPPORTUNITY BRIEF-22, NOAA-81102108
Index No. 81-603-Mim.

Good engineering practice for the design of very large deepwater structures leads to structures with lower resonance frequencies. These natural resonance frequencies are within a range at which waves from small storms are quite energetic. The dynamic amplification of the motion at the natural resonances leads to a serious possibility of damage due to moderate stress, high cycle fatigue. For this reason, detailed knowledge of the vibration response of large offshore structures excited by wave forces is essential for making a safe and effective design. This Brief focuses on 3 related aspects. First, a powerful new method is described for predicting displacement responses (and thereby strain) of a structure at its natural frequencies when excited by random wave forces. The second aspect of the work discusses new approaches to the measurement of damping. While resonance frequency can be measured easily and accurately, measurement of damping at resonance is difficult. Efforts to solve these difficulties are discussed. The third area describes analytical and experimental work in predicting damping of structures in the ocean environment, and especially the dependence of damping on sea state. Progress in understanding and forecasting of damping arising from nonlinear interaction of structural vibration and wave motion is described.

PB82-148388 PC **A12**/MF **A01**
Michigan Technological Univ., Houghton.
Monitoring of Mine Air Diesel Pollutants: Tailpipe Emissions Measurement Apparatus, Detector Tube Interferences, and Exhaust and Ventilation System Control.
Annual rept. 1 Aug 79-31 Jul 80,
John H. Johnson, David H. Carlson, Edward O. Reinbold, and Mark D. Osborne. 31 Jul 80, 267p BUMINES-OFR-3-82
Contract J0199125
See also PB-295 670.

The objective of this work was to develop and test engineering approaches to the control of air quality for the protection of miners health in dieselized underground mines. A general experimental approach was developed by which instruments could be compared for the measurement of diesel exhaust pollutant concentrations in the 0.5 to 5 TLV range. Drager detector tube diluted exhaust CO, CO2, NO, and NO2 measurements were compared with simultaneously taken portable instrument measurements. The effects of two exhaust system configurations on the pollutant concentrations in a dead-end heading were studied in the report.

PB82-148644 PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Wave Propagation Lab.
Field Measurements in Support of Dispersion Modeling in Complex Terrain (1980).
Annual rept.,
Wynn Eberhard. Jul 81, 26p NOAA-TM-ERL-WPL-78, NOAA-81102005

The EPA is engaged in a concerted effort to develop models for prediction of air quality in complex terrain. Remote sensors and an instrumented aircraft from the Wave Propagation Laboratory and other elements of NOAA's Environmental Research Laboratory are participating with EPA in a series of field experiments that are necessary for development and validation of such models. A calibrated particulate-mapping lidar with multi-wavelength capability is the principal remote sensor. NOAA's accomplishments during the first year (February 1980 - January 1981) under the EPA-NOAA Interagency Agreement for Energy and Environment are (1) participation by lidar and other sensors in EPA's Small Hill Impaction Study No. 1 studying plume impingement on elevated terrain, (2) preliminary experiment by instrumented aircraft on power plant plumes near Farmington, New Mexico, (3) lidar participation in DoE's 1980 ASCOT experiment investigating nocturnal drainage flows in mountainous terrain, and (4) improvements to the lidar for plume-mapping applications.

PB82-149253 PC **A05**/MF **A01**
Public Technology, Inc., Washington, DC.
School Bus Use for Non-School Transportation.
Information bulletin.
Sep 80, 78p DOT-I-80-42

This Information Bulletin explores the fundmental issues involved in using school buses for non-school transportation in either a crisis or non-crisis situation. In this Information Bulletin the following issues and problems are discussed; School Bus Availability, The Regulatory Environment, Local Support, Insurance, Safety, Design and Comfort, Added Maintenance, Labor and Administration-Coordination and Financing. This bulletin also contains all Annotated Bibliography to assist the reader in gathering more information on this particular topic.

PB82-149519 PC **A02**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
The Mapping of the Traffic Noise Climate in Norway,
Tom E. Granquist. Jun 80, 24p ISBN-82-7133-313-5

This report describes how the mapping of the existing noise climate at a national basis was carried out. The analysis of the collected data shows that about half a million inhabitants of the total population (12,5%) is exposed to outdoor noise levels over 60 dBA. The required cost using conventional noise abatement measures was estimated to approximately 1900 mill Nkr (380 mill $).

PB82-149527 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).

Road Users Casualty Risks in Urban Traffic: An Analysis of Accidents and Traffic in a Medium Sized Norwegian Town (Trafikanters Skaderisiko i Bytrafikk: En Analyse av Ulykker og Reiseaktivitet I Haugesund),
Henrik Hvoslef. Oct 80, 62p ISBN-82-7133-325-9
Text in Norwegian.

The report presents calculations of the level of risk in urban traffic. The level of risk for pedestrians and cyclists, pr km travelled in traffic, is 3-5 times the risk for people travelling in a car. To pedestrians and cyclists, roads carrying the most vehicle traffic are most dangerous, while access roads and local distributors are most dangerous to people travelling by car.

PB82-149568 PC **A04**/MF **A01**
Intergovernmental Science, Engineering and Technology Advisory Panel, Washington, DC.
The Transportation of Non-Nuclear Hazardous Materials, ISETAP Task Force Meeting.
Summary rept.
Jun 80, 53p DOT-I-80-46

This report is a summary of the June 1980 Task Force meeting to discuss their problems with managing the transportation of hazardous materials. Thirty-three representative of industry, shipping and government were represented at this meeting. Regulation, enforcement, training, and especially intergovernment coordination were the key issues raised by the participants.

PB82-150871 PC **A04**/MF **A01**
Honeywell Traffic Management Center, New Hope, MN.
UTCS (Urban Traffic Control System) Functional Description - Enhanced First Generation Software.
Technology sharing rept. Jul 77-Aug 79.
Aug 79, 55p FHWA-TS-79-228
Contract DOT-FH-11-9294
Errata sheet inserted.

The subject report is being distributed as the first in a series of documents, which are being developed under an Implementation Division contract, to provide documentation for the UTCS Enhanced First Generation Software. The report describes the functional elements of the enhanced software, and the minimum hardware and operating system program requirements necessary to implement the software.

PB82-151143 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Freight Transport - Delfi Analysis (Fremtidens Godstransport - Delfi-Undersoekelse),
Svein O. Lie. Apr 79, 28p ISBN-82-7133-265-1
Text in Norwegian.

The report describes by means of a Delfi-analysis a possible development of the national freight-transport towards year 2030. The analysis handles the different transportation modes separately.

PB82-151317 PC **A07**/MF **A01**
Tennessee Univ., Knoxville.
Market Opportunity Analysis for Short-Range Public Transportation Planning; Method and Demonstration.
Final rept.,
R. B. Woodruff, D. J. Barnaby, R. A. Mundy, and G. E. Hills. Sep 81, 141p TRB/NCHRP/REP-212, ISBN-0-309-03004-8
Also pub. as ISSN-0077-5614. Library of Congress catalog card no. 79-67355. Sponsored in part by Federal Highway Administration, Washington, DC. Prepared in cooperation with American Association of State Highway and Transportation Officials, Washington, DC. Report on National Cooperative Highway Research Program.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., N.W., Washington, DC.

This report adds substantially to the body of knowledge concerning short-range public transportation planning for cities in the 50,000 to 500,000 population range. A descriptive comprehensive planning model was developed depicting the necessary information and procedural steps required for the application of market opportunity analysis (from the private business world) to public transportation planning. As depicted in the model the application of market opportunity analysis requires both direction from policy decision areas and data from an engineering data base. When applied, the market needs are determined, a transportation system is developed to meet the needs, and the system is tested. The model was tested in a neighborhood of Jacksonville, Florida, at a cost of approximately $100,000. The report concludes that further demonstration of the planning model will be required to determine whether the benefits from application outweigh the costs of data collection. If the entire process were duplicated in another test city, the costs could be expected to be 50 to 60 percent of the initial effort.

PB82-151499 PC **E02**/MF **E02**
National Water Council, London (England).
Water Supply Hygiene: Safeguards in the Operation and Management of Public Waterworks in England and Wales.
Occasional technical paper no. 2.
c1979, 24p ISBN-0-90456-49-6

Water Supply Hygiene is one of a number of publications dealing with health and safety matters which have been issued since reorganization of the water industry in 1974. Much of the work of the water authorities is now carried out by divisions having several functions. This document gives guidance about hygiene and the extent to which common staff and plant can be used within such divisions without in any way impairing the very high standards of drinking water quality which have been established. (Copyright (c) NWC January 1979.)

PB82-151564 PC **A14**/MF **A01**
Jones and Stokes Associates, Inc., Sacramento, CA.
Spokane County Comprehensive Wastewater Management Plan.
Final environmental impact statement,
Kathryn M. Davidson. Aug 81, 323p EPA-910/9-81-087
See also PB81-165441.Portions of this document are not fully legible.

This final environmental impact statement states the Environmental Protection Agency's recommended alternative for wastewater treatment in Spokane County, Washington. The alternative chosen by the county and approved by the EPA includes collection and transport of all county wastewater to the city of Spokane's central wastewater treatment plant.

PB82-152158 PC **A10**/MF **A01**
Delaware Univ., Newark. Coll. of Marine Studies.
The Influence of Geological Structure and Historical Changes in Morphology of Delaware Bay Communities on Environmental Planning.
Technical rept.,
Kathleen Susan Drew. Aug 81, 204p DEL-SG-14-81, NOAA-81101401
Grants NA79AA-D-CZ101, NA79AA-D-00118

The research reported is a combination of a geological study of the immediate shore zone and a socio-economic analysis of the inhabitants of the small villages along the western shoreline of Delaware Bay, a major estuary. By means of analysis of the various types of geological structures and sedimentary environments in the shore zone, the loci of the various villages were analyzed in terms of their viability for long term survival in a transgressive coastal setting. Characteristics of the Delaware Bay shoreline environment which were considered, include winds, which vary seasonally, but are strongest in the winter months, when their prevailing direction is from the northwest; waves, which generally follow the same patterns as winds and longshore currents.

PB82-152273 PC **A16**/MF **A01**
Ohio River Basin Commission, Cincinnati.
The Ohio Main Stem: Water and Related Land Resources Study Report.
Environmental impact statement.
Oct 78, 363p
Sponsored in part by Water Resources Council, Washington, DC.Color illustrations reproduced in black and white.

The report describes the regional water resources management plan for the Ohio River Main Stem. It identifies solutions to existing needs and issues for water resource projects.

PB82-152307 PC **E06**/MF **E06**
National Maritime Inst., Feltham (England).
An Approach to the Design of Navigation Channels,
I. W. Dand. c1981, 111p NMI/R-104

This report discusses some aspects of water-way design from the point of view of safe ship navigation. A method for designing the cross-section and alignment of canals or flooded channels is suggested in which use is made of experimental results obtained recently at NMI. The method (which applies essentially to the conceptual stage of design) is illustrated by means of a worked example. (Copyright (c) Crown Copyright, 1981.)

PB82-152828 PC **A03**/MF **A01**
Economics and Statistics Service, Washington, DC. Natural Resource Economics Div.
Measuring Impacts of Resource Management on Land Quality: A Structure for Analysis.
Staff rept.,
Eric B. Oswald. May 81, 28p AGESS-810508

This paper reviews many existing methods and proposes a new structural model for defining and measuring land quality and for assessing the impacts on land quality of resource development plans and actions. The new model subdivides land quality into two major components: (1) land as a productive and useful resource, and (2) land as a scenic or aesthetic resource. Means to measure these two components and merge them into a land quality index are presented.

PB82-152851 PC **A05**/MF **A01**
TRW Energy Systems Group, Redondo Beach, CA.
A Review of Standards of Performance for New Stationary Sources - Coal Preparation Plants.
Dec 80, 93p EPA-450/3-80-022
Contract EPA-68-02-3174

This study has reviewed and assessed the need to revise the new source performance standards (NSPS) for coal preparation plants. These standards limited particulate emissions or opacities from pneumatic coal cleaning equipment, coal dryers, coal processing and conveying, coal storage, and coal transfer and loading. Control device performances have not changed enough to justify changing the particulate standards. Emissions of SO2 are too small to justify setting standards for this pollutant. EPA plans to investigate coal storage piles and unloading stations as unregulated sources of potential particulate fugitive emissions.

PB82-152869 PC **A14**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.
Bulk Gasoline Terminals - Background Information for Proposed Standards. (Draft Environmental Impact Statement).
Interim final rept.
Dec 80, 323p EPA-450/3-80-038A

Standards of performance to control volatile organic compound emissions from new, modified, and reconstructed bulk gasoline terminal loading racks are being proposed under the authority of Section III of the Clean Air Act. This document contains background information and environmental and economic assessments of the regulatory alternatives considered in developing the proposed standards. A separate Section in this document is devoted solely to an analysis of the potential environmental impacts associated with the proposed standards. Both adverse and beneficial impacts in such areas as air and water pollution, increased solid waste disposal, and increased energy consumption are discussed.

PB82-152877 PC **A04**/MF **A01**
Portland Cement Association, Skokie, IL.
Galvanic Cathodic Protection for Reinforced Concrete Bridge Decks - Field Evaluation.
Final rept.,
D. Whiting, and D. Stark. Jun 81, 75p TRB/NCHRP/REP-234, ISBN-0-309-03159-1
Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 81-52128. Also pub. as ISSN-0077-5614. Report on National Cooperative Highway Research Program.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This report describes the application of four sacrificial zinc anode cathodic protection systems to a reinforced concrete highway bridge deck. Two system designs were found to be the most promising in terms of polarized potentials and protective current densities

achieved during the 3-year monitoring program. One design uses commercially available zinc ribbon anodes spaced at 5-in. (127-mm) centers; the other, custom-fabricated perforated zinc sheets. Both systems are overlaid with an open-graded asphalt friction course. The systems yield maximum current density and polarized potentials under warm and moist environmental conditions.

PB82-153123 PC **A06**/MF **A01**
Pacific Northwest River Basins Commission, Vancouver, WA.
Water and Emerging Energy Technologies: Summary Report.
Mar 81, 106p
Sponsored in part by Water Resources Council, Washington, DC. See also PB82-153131.

In 1977, the Department of Energy requested that the Water Resources Council undertake the required assessments whereupon development of Section 13(a) assessments were begun in the Missouri River, Ohio River, and upper Colorado River Basins. In September 1979, a Memorandum of Agreement between the Water Resources Council and Pacific Northwest River Basins Commission initiated an assessment in the Pacific Northwest. This report documents the findings and conclusions of that 13(a) assessment.

PB82-153131 PC **A07**/MF **A01**
Pacific Northwest River Basins Commission, Vancouver, WA.
Water and Emerging Energy Technologies.
Mar 81, 139p
Sponsored in part by Water Resources Council, Washington, DC. See also PB82-153123.

In 1977, the Department of Energy requested that the Water Resources Council undertake the required assessments whereupon development of Section 13(a) assessments were begun in the Missouri River, Ohio River, and upper Colorado River Basins. In September 1979, a Memorandum of Agreement between the Water Resources Council and Pacific Northwest River Basins Commission initiated an assessment in the Pacific Northwest. This report documents the findings and conclusions of that 13(a) assessment.

PB82-153156 PC **E07**/MF **E07**
National Maritime Inst., Feltham (England).
Wave Loading on Offshore Structures: A Review,
R. G. Standing. c1981, 144p NMI/R-102, OT-R-8113

This report discusses recent work on the following aspects of wave loading: Morison's equation: forces on tubular members; effects of marine growth and surface roughness, slamming and vortex shedding; wave diffraction theory; second-order wave drift forces; structural response and probabilistic methods. It includes an extensive bibliography and some typical results. (Copyright (c) Crown Copyright 1981.)

PB82-153172 PC **E02**/MF **E02**
National Maritime Inst., Feltham (England).
Aerodynamic Forces on Perforated Bridge Decks,
J. R. Richardson. c1981, 24p NMI/R-118

Exact solutions for steady flow over thin perforated bridge decks are derived for constant incidence, simple parabolic camber and a general camber shape. Three types of perforations are considered, namely completely open slots, slots with restricted flow due to grills and uniform closely spaced perforations. All of them give similar results for lift and pitching moment, which can be expressed as simple functions of the solidity ratio. These solutions are intended to be the basis on which a study of the unsteady aerodynamic forces can be undertaken, with the object of analyzing the flutter characteristics of bridges with perforated road decks.

PB82-153354 PC **A06**/MF **A01**
Purdue Univ., Lafayette, IN. Water Resources Research Center.
Proceedings and Recommendations of the Workshop on Groundwater Problems in the Ohio River Basin, April 28-29, 1981, Cincinnati, Ohio,
A. Ramachandra Rao, Edward J. Hood, and D. Wiersma. Apr 81, 112p W82-02106, OWRT-C-90054-T(9615)(2)

The workshop was an outgrowth of an activity by the Ohio River Basin Commission's Task Force on ground and surface water interrelationships. The task force was composed of representatives of the eleven Ohio River Basin states. Presentations by state, federal, university and industry representatives focused on identification and discussion of the full range of state and regional technical and policy-related ground water management problems, provided information on related federal agency programs and research activities, and examined developments in ground water quality and quantity modeling.

PB82-153388 PC **A08**/MF **A01**
Bracken and Baram, Boston, MA.
Legal, Economic and Institutional Barriers to Water Resue in Northern New England.
Technical completion rept.,
Michael S. Baram. Sep 80, 163p W82-02107, OWRT-C-90186-R(9424)(1)
Contract DI-14-34-0001-9424
Also pub. as OWRT/RU-81/6.

Legal and institutional reforms at federal, state and local levels of government are needed to remove major obstructions to water reuse as a conservation strategy in northern New England. Legal research and seven case studies on municipal, industries, energy and agricultural users of water in Massachusetts, New Hampshire, Maine and Vermont reveal that the obstructions to water reuse call for immediate legal reforms in four areas: Availability of public funds under federal construction grant program for wastewater treatment; use of environmental controls on current practices to force adoption of reuse technology; modification of property rights in water doctrines of the common law; and modification of water rates and rate structures now in use. Further, institutional reforms are needed. The networking of fragmented authorities is needed to promote coherent regional strategies for conservation and reuse. Thus, future water management in northern New England could begin to cope with growing water shortages by adopting conservation principles and reuse practices.

PB82-153537 PC **A09**/MF **A01**
Tennessee Univ., Knoxville.
Institutional Barriers to Implementing 208 Water Quality Management Plans in the Southeast: Volume I - Technical Report. Part I - Institutional Barriers,
George E. Bowen, and Timothy Gangaware. May 81, 193p W82-02101, OWRT-C-90234-U(9434)(1)
Contract DI-14-34-0001-9434
See also Volume 2, PB82-153545.
Also available in set of 3 reports PC E15, PB82-154529.

The primary objective of the study was to make comparisons and assessments of institutional barriers and inter-agency relationships which impaired the ability of 208 areawide agencies to develop acceptable comprehensive water quality management plans within the southeastern United States. A secondary objective of the study focused on an analysis of citizen participation mechanisms employed in the development of the 208 programs, in order to develop alternative approaches for enhancing general public input into water quality management programs.

PB82-153545 PC **A09**/MF **A01**
Tennessee Univ., Knoxville.
Institutional Barriers to Water Quality Planning and Management in the Southeast: Volume II - Technical Report. Part II - Issues, Problems, and Data,
George E. Bowen, and Timothy Gangaware. May 81, 194p W82-02102, OWRT-C-90234-U(9434)(1)
Contract DI-14-34-0001-9434
See also Volume 1, PB82-153537, and Volume 3, PB82-153552.
Also available in set of 3 reports PC E15, PB82-153529.

This volume was intended to be a reference document for persons unfamiliar with many of the issues and problems associated with water quality planning and management. As a reference document, it contains information on regulatory features of the 208 programs, legal background for water quality planning, a description of citizen participation techniques and a summary of the case studies.

PB82-153552 PC **A03**/MF **A01**
Tennessee Univ., Knoxville.
Institutional Barriers to Water Quality Planning and Management in the Southeast: Volume III - Annotated Bibliography,
George E. Bowen, and Timothy Gangaware. May 81, 48p W82-02103, OWRT-C-90234-U(9434)(1)
Contract DI-14-34-0001-9434
See also Volume 2, PB82-153545.
Also available in set of 3 reports PC E15, PB82-153529.

This volume of the report, the annotated bibliography, was intended to be a basic reference source for persons engaged in water quality planning, management, and research. The annotations are divided into six basic categories: books, periodicals, government publications, conference proceedings, water resource center reports and others.

PB82-153602 PC **A04**/MF **A01**
Statens Levnedsmiddelinstitut, Soeborg (Denmark).
Studies Regarding Heavy Metals in Salt-Water and Coastal Fish, 1973-1975 (Undersoegelser Vedroerende Tungmetaller i hav- og Kystfisk, 1973-1975),
Ase Engberg. Jun 81, 74p
Text in Danish.

The report describes a study made of 120 specimens (257 fish) of flounders, cod and herring and 44 specimens of flounder livers from the Baltic Sea, Oresund, Kattegat and the North Sea to determine typical contents of mercury, lead, cadmium, copper and zinc. The study showed systematic variations in how much that content depends upon where the fish are caught. No conclusions can be drawn from the results of the study on the significance of those concentration differences for the entire fish population or on a relation between the releasing of metal along the coast and components of the food chain which come ahead of fish in that chain.

PB82-153693 PC **A04**/MF **A01**
West Virginia Univ., Morgantown. Water Research Inst.
Microbial Purification of Recycled Wastewater,
William J. Shoupp, John M. Dingess, and Paul G. Moe. 1981, 73p WRI-WVU-81-01, INFORMATION-15, W82-02172, OWRT-A-034-WVA(2)
Contract DI-14-34-0001-9052

A recycling sanitary-waste disposal system was developed and tested in the laboratory by using a synthetic fecal-urinous waste material. The system was capable of supporting an aerobic microbial population with an organic loading equivalent to the waste of three adults by using an aeration rate of 12 liters of air per minute. Increasing the temperature of the digestion tank from 23C to 34C reduced the rates of sludge and ammonia-nitrogen accumulation but had little effect on BOD-reduction efficiency. Shock loads of feed up to seven times normal rate caused temporary perturbations, but the microbial population in the system showed remarkable stability and rapid recovery. The BOD-reduction efficiency was generally better than 85 percent.

PB82-153826 PC **A02**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
Pollutant Transport in Mississippi Sound.
Interim technical rept. no. 1,
Julia S. Lytle, and Thomas F. Lytle. 1979, 19p MASGP-79-032, NOAA-81111609
Grant NA79AA-D-00049
Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, MS.

This study was conceived to characterize the pollutants of Mississippi Sound, clarify those processes responsible for pollutant movement and to develop criteria that will be required for a more responsible coastal management than that used in the past. In 1979 the study area was the region influenced by the Pascagoula River in the eastern Mississippi Sound.

PB82-153834 PC **A02**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
Pollutant Transport in Mississippi Sound.
Interim technical rept. no. 2,
Julia S. Lytle, and Thomas F. Lytle. 1980, 18p MASGP-80-028, NOAA-81111611
Grant NA80AA-D-00017
Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, MS.

Most analyses in 1979 were limited to surface sediment samples in the Escatawpa-Pascagoula River. Analyses of sediment cores taken from a much larger area of the eastern Mississippi Sound was the principal analytical activity of 1980. Hydrocarbons appear to be

a dominant pollutant in Sound samples. Interpretations of the hydrocarbon data obtained on cores from the eastern Sound are summarized in the report.

PB82-153891 PC **A03**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
Pollution Impact in Mississippi Coastal Waters,
Thomas F. Lytle, and Julia S. Lytle. 1980, 30p
MASGP-80-020, NOAA-81111610
Grant NA80AA-D-00017
Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, MS.

Studies of St. Louis Bay and the Pascagoula River provided a considerable number of contrasts. St. Louis Bay prior to any major development displayed sediment profiles with almost complete lack of any elevated pollutant levels and a distribution of trace metals and hydrocarbons consistent with a relatively pristine environment. Areas in the Pascagoula River, used for many years as prime industrial sites, have very high pollutant levels in the sediments, particularly hydrocarbons. Sediments of the Pascagoula River are extremely heterogeneous indicating not only anthropogenic sources of input but that the Pascagoula River has little ability to disperse or 'dilute' polluted sediments which are deposited and concentrated near the point of origin. The Corps of Engineers typically makes dredge permit decisions based in part upon gross analysis of composite sediment samples from dredge areas.

PB82-153958 PC **A20**/MF **A01**
JRB Associates, Inc., McLean, VA.
Assessment of the Impacts of Industrial Discharges on Publicly Owned Treatment Works: Appendicies.
Final rept.
Nov 81, 468p
Contract EPA-68-01-5052

The Regulatory Impact Analysis Report (Final) was prepared to evaluate the General Pretreatment Regulations (40 CFR 403) and a range of possible alternative regulatory strategies/options in a manner consistent with the intent of Executive Order 12291. This evaluation examined the need to protect the operations of publicly owned treatment works from industrial discharges, the potential contamination of POTW sludge, and the need to control the pass through of toxic pollutants specifically included in EPA categorical pretreatment standards for industries. The analysis focuses on identification of key policy issues and relevant data and use of analytical techniques to assist EPA in evaluating the General Pretreatment Regulations.

PB82-154089 PC **A03**/MF **A01**
Public Technology, Inc., Washington, DC.
Air Quality Regulation and Planning.
Information bulletin.
Jan 80, 36p DOT-I-80-16

This bulletin covers the impact of air quality concerns as they affect economic and transportation functions across the country. The specific emphasis of the bulletin is on motor vehicle inspections, and their potential contribution to reducing air pollution. Programs of the Environmental Protection Agency (EPA) and other federal agencies are described.

PB82-154105 PC **A05**/MF **A01**
Public Technology, Inc., Washington, DC.
Transportation System Management, Air Quality, and Energy Conservation.
Information bulletin.
Sep 80, 86p DOT-I-80-47

This information bulletin explores Transportation Systems Management (TSM) issues and problems, such as mandates for TSM, Air Quality and Transportation, Energy TSM, TSM Goals and Trade-offs, Effectiveness of TSM Strategies, Planning and Implementing TSM, and Local Government concerns in formulating TSM plans. This Information Bulletin also contains a list of a cross-section of important general contracts and programs as a starting part for more detailed inquiries, as well as an Annotated Bibliography for the readers future reference.

PB82-154188 PC **A22**/MF **A01**
International Road Federation, Washington, DC.
World Survey of Current Research and Development on Roads and Road Transport, 1981.
Annual rept.
Dec 81, 525p
Contract DTFH61-81-C00023
See also report for 1980, PB81-164402. Prepared in cooperation with Organization for Economic Cooperation and Development, and Transportation Research Board.

The report is the 16th in a series of annual reports on inventories of research and development projects conducted by governmental, academic and commercial research organizations in 54 countries, as reported by surveyors of the International Road Federation, the International Road Research Documentation program of the OECD, and the HRIS. It is the only publication that reports world-wide information on current research activities in the highway field. The report lists 4,988 projects, classified in accordance with the subject area classification system of the Transportation Research Board.

PB82-154204 PC **A05**/MF **A01**
Little (Arthur D.), Inc., San Francisco, CA.
East/Central Contra Costa County Wastewater Management Plan: Acute Impact of Discharge at Alternative Outfall Locations.
Jun 76, 85p
Prepared in cooperation with Reid (Thomas) Associates, Palo Alto, CA.

This study is an analysis and comparison of three alternative discharge locations for the North Shore subregional wastewater treatment facility. It addresses the acute, local impacts on fish that result from immediate effluent dilution in the vicinity of the outfall. Three alternative sites are located 45 to 55 miles upstream in the San Francisco Bay estuary in an area dominated by tidal flow. There is variable salinity and semidiurnal tidal change resulting in alternating upstream and downstream currents which alternate every 6 1/4 hours.

PB82-154212 PC **A05**/MF **A01**
Little (Arthur D.), Inc., San Francisco, CA.
East/Central Contra Costa County Wastewater Management Plan.
Draft environmental impact statement (Summary).
Apr 76, 80p
Prepared in cooperation with Reid (Thomas) Associates, Palo Alto, CA.

The purpose of the wastewater management plan is to provide adequate treatment and disposal for sewage from a present day population of 90,000 persons in Contra Costa County. The locality studied includes extensive residential, agricultural, industrial and recreational areas bounded on the north by the Sacramento and the San Joaquin Rivers. The River system is subject to important beneficial uses including fish and wildlife habitat, recreation and freshwater withdrawal for irrigation, domestic supply and industrial use. The proposed project provides for conveyance of sewage located to the east of Pittsburg; Local secondary treatment and land disposal and discharge to the surface waters of the Sacramento Bay and estuary.

PB82-154345 PC **A05**/MF **A01**
Exxon Research and Engineering Co., Linden, NJ. Products Research Div.
Sulfate Control Technology Vehicle Testing.
Final rept.,
Dennis F. Hess, Mary H. Keirns, and Kenneth C. Bachman. Dec 81, 88p EPA-460/3-81-035
Contract EPA-68-03-2342

A total of four vehicles, two low excess air-oxidation catalyst systems and two three-way catalyst systems, were built to demonstrate the feasibility of low sulfate production automotive emission control technology. The general conclusions are summarized: (a) To successfully implement the low excess air concept the engine's fuel metering system must be capable of controlling the A/F ratio at the required 'slightly lean' value regardless of vehicle driving mode. (b) Secondly, the oxidation catalyst bed must light-off quickly from cold start conditions. (c) Third, the three-way catalyst must be maintained within its operating window by precise control of the engine at a stoichiometric A/F ratio.

PB82-154352 PC **A04**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Using Chemically Modified Sulfur as a Joint Sealant.
Final rept. Feb 80-Jul 81,
B. B. Gerhardt, and A. C. Ludwig. Jul 81, 56p 05-6025, FHWA/RD-81/503
Contract DTHF61-80-C-00033

A study was made to determine if it were reasonable to expect that Sulphlex-like pavement sealants could be developed within the bounds of an economically justifiable research effort. The properties of commercially acceptable sealants were investigated by performing tests and reviewing specifications used by major design and construction agencies. These properties were compared with the characteristics of modified sulfur formulations developed during a previous research project and during subsequent research work sponsored by the Southwest Research Institute. The findings were as follows: asphalt alone is a less than desirable pavement sealant; since Sulphlex was developed to be as much like asphalt as possible, the existing formulations are not excellent sealants. They do have characteristics of many of the asphalt-based sealants on the market, however, to obtain a good quality pavement sealant from plasticized sulfur, it will be necessary to develop new formulations which bond well to PCC and asphaltic cement surfaces, and which maintain a nonflowing elastic surface at temperatures between -20F and 140F (-29C and 60C). This appears to be possible by optimizing proportions of available plasticizers and fibers.

PB82-154535 PC **A12**/MF **A01**
Public Technology, Inc., Washington, DC.
Transit Actions: Techniques for Improving Productivity and Performance.
Final rept.
Oct 79, 259p DOT-I-79-18

The workbook contains actions which cut the cost of providing transit services or improve system operating efficiency and effectiveness. The three perspectives presented in the beginning of this workbook emphasize the need to improve productivity and performance. The remainder of the workbook is divided into five areas: Service Level, Transit Financing Policies, Internal Management, Labor-Management Relations, and Performance Measures.

PB82-155052 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Coordination between the Transportation System and the Terminal Function (Samordning Mellom Transportkjede og Terminalfunksjon),
Tore Fossum. Dec 80, 50p ISBN-82-7133-337-2
Text in Norwegian.

This report shows how to use Critical Path Method network theory to point out the bottle-necks in the existing goods-transportation systems, including harbor terminals. The flow of Information, Documents and Goods through the transportation system is analyzed. When all activities necessary to maintain this flow are on Critical Paths in the Network, the terminal activities are fully coordinated within the transportation system.

PB82-155094 PC **A05**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Reloading and Transport of Waste (Omlasting og Transport av Avfall),
Nina Ringnes, and Robert Svendsen. Aug 80, 90p
ISBN-82-7133-321-6
Text in Norwegian.

The report describes various systems for transfer and transportation of solid waste. Total costs per 1000 kg transported solid waste are calculated. There is also given a technical description of the various systems.

PB82-155110 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
A Model for Traffic Transportation and Energy: The Effect of the 'Safe Traffic' Campaign Concerning 'The Weal Edges in Traffic' (Modell for Samferdsel og Energi: Samspell Mellom Sektorer Innen Samferdsel og Med Resten av Samfunnet),
Odd Gulbrandsen. Nov 80, 62p ISBN-82-7133-332-1
Text in Norwegian.

The paper describes a System dynamics model for long-range analysis of policies in the transport- and communication-sector. The model deals with the dependency between passenger car, bus, pedestrian/bicycle, telecommunication and economic activities in the country.

PB82-155508 PC **A05**/MF **A01**
International Engineering Co., Inc., Denver, CO.

Water Assessment Report on Paraho Oil Shale Demonstration Plant, White River Basin - Utah.
Aug 81, 76p
Sponsored in part by Water Resources Council, Washington, DC. Errata sheet inserted.

The Federal Non-nuclear Energy Research and Development Act of 1974, as amended, provides that the U.S. Water Resources Council (WRC) will undertake assessments of water resource requirements and water supply availability for any non-nuclear energy technology. Acting under the provisions of Section 13(b) of the Act, the Department of Energy by letter dated April 23, 1980, requested that WRC undertake a water assessment for the Paraho Oil Shale Demonstration Project to be constructed in Uintah County, Utah. The objectives of the study were to develop and analyze relevant information and data which could be used as a basis to document: (1) water requirements for the project, (2) present and future water supply availability, and (3) water resources impacts.

PB82-156092 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Effects of the Road Safety Organization Campaign for 'Disadvantaged Road Users' (Effekten av Trygg Trafikk's Kampanje 'De Svake Trafikantene'),
Alf Glad. Nov 79, 34p ISBN-82-7133-279-1
Text in Norwegian.

The report presents an effect-study of the campaign 'The disadvantaged road-users'. The campaign was conducted by sending out a brochure attached to motoring magazines. Interviews showed that the brochure reached 1/3 of Norwegian households, but only 11% of the population above fourteen years had read it. The reader-group had somewhat better knowledge of the campaign-message than had a non-reader group.

PB82-156159 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Road Traffic and Risk Experience of the Individual Driver (Vegtrafikk og Risikoopplevelse hos Individet),
Trond O. Pedersen. Jun 80, 29p ISBN-82-7133-318-6
Text in Norwegian.

The report presents the road traffic as a system with built-in accident risks. Different theories, models and data concerning individuals traffic behavior and perception of traffic hazards are presented and discussed. The survey is based on published literature in the field.

PB82-156167 PC **A04**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Scenarios of Norwegian Road Traffic in the Year 2000 (Bilder av Norsk Samferdsel i Ar 2000),
Odd Gulbrandsen. Nov 80, 66p ISBN-82-7133-335-6
Text in Norwegian.

The report gives two alternative descriptions of the Norwegian transportation system in the year 2000. The main difference between alternatives is the chosen development of prices for petroleum products on the world market. Even though the price alternatives are very different, growth in economy and transportation is expected in both cases. The expected technological development is described.

PB82-156423 PC **A14**/MF **A01**
RAND Corp., Santa Monica, CA.
Economic Implications of Regulating Chlorofluorocarbon Emissions from Nonaerosol Applications.
Final rept.,
Adele R. Palmer, William E. Mooz, Timothy H. Quinn, and Kathleen A. Wolf. Oct 80, 308p R-2524-EPA, EPA-560/12-80-001
Contracts EPA-68-01-3882, EPA-68-01-6111
Sponsored in part by Consumer Product Safety Commission, Washington, DC., and Food and Drug Administration, Washington, DC. See also PB82-156431.

The study examines and compares the outcomes of two alternate methods for controlling nonaerosol emissions of chlorofluorocarbons (CFCs). Conventional regulatory methods such as technology standards are compared with innovative methods of regulation such as use taxes or production quotas distributed through the use of marketable permits. The economic costs of each system are calculated and compared, along with a discussion of the policy issues which must be addressed when choosing one form of regulation over another.

PB82-156431 PC **A06**/MF **A01**
RAND Corp., Santa Monica, CA.
Regulating Chlorofluorocarbon Emissions: Effects on Chemical Production.
Final rept.,
Kathleen A. Wolf. Oct 80, 115p N-1483-EPA, EPA-560/12-80-001B
Contracts EPA-68-01-3882, EPA-68-01-6111
See also PB82-152423. Sponsored in part by Consumer Product Safety Commission, Washington, DC., and Food and Drug Administration, Washington, DC.

This report focuses on the manufacture of chlorofluorocarbons and the precursor chemicals. It is a support document for the Rand Corporation study: Adele R. Palmer, et. al., Economic Implications of Regulating Nonaerosol Chlorofluorocarbon Emissions, R-2524-EPA.

PB82-156746 PC **A05**/MF **A01**
International Engineering Co., Inc., Denver, CO.
Water Assessment Report on Rio Blanco Oil Shale Demonstration Project, White River Basin - Colorado.
Sep 81, 85p
See also PB82-156738. Sponsored in part by Water Resources Council, Washington, DC.

The assessment of the water resource impacts of the potential Rio Blanco Oil Shale Project is mandated by Federal law. The Non-nuclear Energy and Development Act of 1974, as amended, provides that the U.S. Water Resources Council will undertake assessments of water requirements and water availability for any non-nuclear energy technology which is in line for Federal Assistance authorized by the Act. The study inventoried the water resources occurrence, use problems, and future availability within the White River Basin.

PB82-156753 PC **A03**/MF **A01**
International Engineering Co., Inc., Denver, CO.
Water Assessment Reports on Rio Blanco Oil Shale Demonstration Project and Cathedral Bluffs Shale Oil Demonstration Project, White River Basin - Colorado. Appendices C and D.
Sep 81, 34p
See also PB82-156738. Sponsored in part by Water Resources Council, Washington, DC.Portions of this document are not fully legible.

This report includes: Appendices C, simulation model description and sample outputs; and appendices D, advisory committee meeting minutes. This data pertains to water supply assessments made for the Rio Blanco oil shale demonstration project, and Cathedral Bluffs shale oil demonstration project which are located in Utah and Colorado.

PB82-156761 PC **A07**/MF **A01**
Water Resources Council, Washington, DC.
Synthetic Fuels Development in the Upper Colorado Region: Section 13(a) Water Assessment Report.
Technical rept.
Jul 81, 138p
See also PB82-157413.

The following general conclusions and major specific findings were reached during the course of the water assessment for the Upper Colorado Region. The production of synthetic fuels in the Upper Colorado River Region by the extraction and processing of oil shale and/or coal, will require significant quantities of water. The overall supply of ground and surface water resources in the Region is sufficient to accommodate a synfuels production level of nearly 3 million barrels oil equivalent per day. While the gross water supplies in the Region are sufficient for accelerated synfuels development, water supply problems are apparent in some areas.

PB82-156829 PC **A07**/MF **A01**
Raven Systems and Research, Inc., Washington, DC.
The Relationship Between Motor Carrier Economic Regulation and Highway Safety,
Thomas A. Domencich, Stephen Sobotka, and Morris Gottlieb. Sep 81, 135p DOT-P-30-81-86
Contract DOT-OS-90048
Prepared in cooperation with Market Facts, Inc., Washington, DC., and Sobotka (Stephen) and Co., New York.

The purpose of the study is to investigate the relationship between regulatory status and safety performance in the motor carrier industry. In a first phase, the study reviewed and analyzed available data and research. It concluded that a study finding significant difference in accident rates was subject to statistical errors and that available data had not been collected in such a way as to enable the question to be analyzed using sound statistical procedures. The second phase of the study collected and analyzed data designed specifically to determine if there is a relationship between regulatory status and truck accidents. No statistically significant relationship was found; thus, the hypothesis of a relationship between regulatory status and truck safety was not demonstrated.

PB82-157140 PC **A02**/MF **A01**
National Highway Traffic Safety Administration, Washington, DC.
Evaluation of State Motorcycle Helmet Laws Using the National Electronic Injury Surveillance System.
Final rept. 1978-1980,
A. Berkowitz. Oct 81, 12p DOT-HS-806 062

This report analyzes motorcyclist injury data collected by the National Electronic Injury Surveillance System (NEISS) from October 1978 through December 1980. Head area injury rates were compared for NEISS-reporting States with and without a mandatory helmet use law. The States without a helmet law had significantly greater head area injury rates than the States with a helmet law. In addition, the serious injury rate for the head and neck were significantly lower in the States having a helmet law as compared with the States not having a helmet law. It was concluded that State motorcycle helmet law's are effective in decreasing all motorcyclist head area injury rates as well as lowering most head area serious injury rates.

PB82-158072 PC **A09**/MF **A01**
JRB Associates, Inc., McLean, VA.
Analysis of Wastewater Discharge from Marine Sanitation Devices.
Final rept.
Apr 81, 181p EPA-440/2-81-013
Contract EPA-68-01-6347

This report presents data pertinent to analyzing alternative Federal policies for regulating the discharge of human wastes from recreational watercraft. The study indicates that low compliance with the current marine sanitation device (MSD) regulations is the result of deliberate resistance, uncertainty about the finality of the current regulations, and doubt that the regulations will be effectively enforced. The report indicates that pleasure boats, particularly when congregated in relatively slow-moving waters, such as marina basins or inlets with minimal current or tidal action, can produce unacceptable fecal coliform concentrations. This is of particular concern because shellfish can accumulate sewage-borne microorganisms, rendering the shellfish unacceptable for human consumption. Of the two major disinfectant chemicals commonly used in MSD's (chlorine & formaldehyde), only chlorine has been shown to be toxic in the aquatic environment, but only in discharges from large shore-based facilities, such as sewage treatment plants.

PB82-162504 PC **A03**/MF **A01**
Maine Univ. at Orono. Social Science Research Inst.
Comparison of Signs and Markings for Passing/No-Passing Zones.
Final rept. Jun 78-Sep 80,
Richard W. Lyles. Aug 81, 40p FHWA/RD-81/095
Contract DOT-FH-11-9401
See also PB82-162603.

Overtaking and passing maneuvers are two of the most common sources of conflict between two or more vehicles on two-lane, two-way rural roads. While the signing and marking of passing/no-passing zones has received considerable attention there is still a lack of consensus relative to the effectiveness of the various methods, how they should be used, and what the enforcement policies should be. In this context, the research effort reported on herein was directed to the evaluation of several alternative methods for marking/signing of passing and no-passing zones in rural two-lane situations.

PB82-162603 PC **A02**/MF **A01**
Maine Univ. at Orono. Social Science Research Inst.
Comparison of Signs and Markings for Passing/No-Passing Zones.
Executive summary Jun 78-Sep 80,
Richard W. Lyles. Aug 81, 12p FHWA/RD-81/094

Contract DOT-FH-11-9401
See also PB82-162504.

The report reviews an experiment undertaken to examine the relative effectiveness of five pavement marking/signing sequences for informing motorists of passing and no-passing zones on rural two-lane roads. Treatments examined included: (1) standard pavement markings; (2) pavement markings plus standard regulatory signing; (3) pavement markings plus no-passing pennants; and (4) and (5) two combinations of regulatory signs and pennants. Data were collected on overtaking/passing vehicles by two observers in a staged vehicle that traveled over a measured length of roadway. The principal findings were that the addition of any sign sequence to pavement markings resulted in motorists being both more observant of passing and no-passing zones and spending less time in the passing (opposing) lane. Less conclusive evidence was presented in support of the more emphatic/informative sequences resulting in progressively more compliance with the marked zones.

PB82-862228 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Industrial Management and Decision Making Toward Environmental Pollution. February, 1978-February, 1982 (Citations from the Management Contents Data Base).
Rept. for Feb 78-Feb 82.
Feb 82, 212p
Supersedes PB81-852261.

Environmental protection, regulation, legislation, research, and decision making are discussed in this bibliography. Concerned publications are in industrial waste management, land use control, toxic dump problems, waste control and treatment. Environmental impact statements for future planning and information of hazardous chemicals are also included. (This updated bibliography contains 299 citations, 99 of which are new entries to the previous edition.)

13C. Construction Equipment Materials, and Supplies

AD-A108 984/6 PC **A04**/MF **A01**
Puerto Rico Univ., Mayaguez. Dept. of Civil Engineering.
Implementation of a Postcracking Model for Finite Element Analysis of Reinforced Concrete.
Final rept. 1 Feb-31 Jul 81,
Rafael Jimenez-Perez. Sep 81, 66p AFOSR-TR-81-0868
Grant AFOSR-81-0092

A computer code has been developed to model the nonlinear response of reinforced concrete elements subjected to plane strain, plane stress or axisymmetric loading conditions. The material subroutine includes the following sources of nonlinear behavior: (a) Nonlinear stress strain curve for concrete as represented by the endochronic model; (b) stress-strain curve for the reinforcement including the elastic, plastic and strain hardening stages; (c) concrete anisotropy caused by complex stress states and cracking; and (d) the post-cracking shear transfer mechanisms. The computer code has been checked with a very limited amount of experimental data for plain concrete and for an initially cracked reinforced concrete panel subjected to biaxial stress states. In general, the code predicts results that agree satisfactorily with the experimental data but needs to be further checked against additional test cases.

AD-A108 988/7 PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
Abrasion-Erosion Resistance of Fiber-Reinforced Concrete.
Final rept.,
Tony C. Liu, and James E. McDonald. Nov 81, 31p
Rept no. WES/MP/SL-81-32

FRC (fiber reinforced concrete) has been used for repair of abrasion-erosion damaged areas such as stilling basins, conduits, sluiceways, and discharge laterals in hydraulic structures. However, the resistance of such concrete subjected to abrasive action of waterborne particles had not previously been evaluated. Thirteen concrete mixtures of three water-cement ratios ranging from 0.40 to 0.72, each containing one of four different types of steel fibers, were tested. As is true of concrete without steel fibers, the abrasion-erosion resistance of FRC increased with decrease in water-cement ratio and consequent increase in compressive strength. The lengths of the fibers had very little effect on the abrasion-erosion resistance, and the FRC containing collated and hooked fibers had better abrasion-erosion resistance than the comparable concrete containing straight fibers. A comparison of the performance of FRC and concrete not containing fibers clearly showed that FRC was less resistant to abrasion-erosion than concrete of the same aggregate type and water-cement ratio without fibers. The abrasion-erosion losses of the FRC were consistently higher than those of the concrete not containing fibers over wide ranges of water-cement ratio and hence compressive strength. Based on the results of laboratory tests and field performance experience, FRC is not recommended for use in new construction or repair of hydraulic structures where abrasion-erosion is a major concern.

PB82-861402 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Structural Steel in the Building Industry. 1974-February, 1982 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1974-Feb 82.
Jan 82, 68p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, D.C.

Citations in this bibliography include construction industry steel utilization emphasizing structural analyses, innovations, and applications. Prefabrication of steel framed structures, stress-strain factors in tubular steel components, computerized designing and fabrication of structural steel systems, utilization of rolled-formed galvanized steel studs, composition of high-strength steel building materials, and corrosion of steel building structures are included. Performance evaluations of steel structural components are also examined. (Contains 75 citations fully indexed and includes a title list.)

PB82-861444 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Concrete Polymer Composites. 1977-February, 1982 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1977-Feb 82.
Feb 82, 150p

Reports are cited which discuss the development, effect on the construction and building industry, and the application of polymer modifiers in concrete. Polymer concrete highway construction and chloride penetration; epoxy resins, unsaturated polyesters and polystyrene binders for concrete; machinery and equipment used for polymer concrete manufacture; polymer impregnated concrete comparison to conventional concretes; and thermal insulation properties of plastic aggregates in concrete are among the topics discussed. Mechanical properties, performance evaluations and applications for polymer concrete in such areas as pavement, bridge and runway maintenance are included. (Contains 156 citations fully indexed and includes a title list.)

PB82-861535 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plastic Building Materials for Underground Construction. 1977-February, 1982 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1977-Feb 82.
Feb 82, 95p

This bibliography contains citations concerned with the development and applications of polymer-based construction materials and structures for underground installation. PVC extruded sheet for tunnel roofing, glass-reinforced polyester panels for underground train stations, polyfilm plastic film for underground silos to store agricultural produce, and structural foam protection for pipeline test stations are among the topics considered relative to underground utilization. Polymeric resins designed to seal underground structuress and developments in plastic drainage tiles for underground installation are discussed. (Contains 108 citations fully indexed and includes a title list.)

PB82-861741 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Glass as a Building Construction Material. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 158p

Citations in this bibliography include evaluations of experimental studies performed on the utilization of glass in the building industry. Thermal stress-strain on glass walls subjected to solar radiation, multi-plate glass wall thermal analysis for building envelope energy transfer, window glass design technology, passive heating glass system design, and economic evaluation of brick masonry and glass office buildings are among the subjects discussed. The insulating value of glass, with reference to both thermal and acoustic energy is also included in this bibliography. (Contains 171 citations fully indexed and includes a title list.)

PB82-862202 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cement Clinker Preparation and Analysis. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 174p

Citations in this bibliography include technological reports on the production of cement clinker. Advantages of the newly developed precalcination process in cement clinker manufacture for fuel conservation; the crystallization of melts prepared during the firing of portland cement clinkers; effects of altered burning conditions within the kiln on color, set-up time and strength of cement; structure and properties of zinc oxide doped cement clinker; and developments in clinker cooling and handling methods are among the subjects discussed. Electron microprobe and X-ray diffraction analyses of the distribution of clinker elemental variations are also included. (Contains 193 citations fully indexed and includes a title list.)

PB82-862210 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Lightweight Concretes. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 148p

Reports are cited which discuss the composition, mechanical properties, applications, and performance evaluation of lightweight concrete. Thermal insulation value; lightweight aggregates such as clay, shale, slate and polymeric composites; pumpability; workability; structural analysis; seismic stability; and precast lightweight construction are among the topics discussed relative to the manufacture and performance of lightweight concrete. Economic trends and industrial outlook for utilization in building construction is included. (Contains 164 citations fully indexed and includes a title list.)

13E. Couplings, Fittings, Fasteners, and Joints

N82-14533/5 PC **A06**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
Use of Two-Dimensional Transmission Photoelastic Models to Study Stresses in Double-Lap Bolted Joints.
Contractor Report, Apr. 1980 - Jun. 1981.
M. W. Hyer, and D. H. Liu. Nov 81, 111p NASA-CR-165812
Grant NSG-1621
Sponsored in Part by Army.

The stress distribution in two hole connectors in a double lap joint configuration was studied. The following steps are described: (1) fabrication of photoelastic models of double lap double hole joints designed to determine the stresses in the inner lap; (2) assessment of the effects of joint geometry on the stresses in the inner lap; and (3) quantification of differences in the stresses near the two holes. The two holes were on

the centerline of the joint and the joints were loaded in tension, parallel to the centerline. Acrylic slip fit pins through the holes served as fasteners. Two dimensional transmission photoelastic models were fabricated by using transparent acrylic outer laps and a photoelastic model material for the inner laps. It is concluded that the photoelastic fringe patterns which are visible when the models are loaded are due almost entirely to stresses in the inner lap.

N82-14541/8 PC **A04**/MF **A01**
Institut de Soudure, Paris (France).
Study of the Fatigue Behavior of Welded Joints, Cross Stressed Etude du Comportement a la Fatigue de Joints Soudes Sollicites selon le Travers Court.
Final Report.
F. Maltrud. 28 Aug 80, 57p CETIM-12-Y-200, IS-10-830
Contract CETIM-4-76-2692
Text in French.

Fatigue tests were carried out on welded steel specimens. The influence of inclusions in the welded specimens on fatigue resistance was studied. Results show that inclusions influence fatigue behavior only when they provoke damage before fatigue testing. For example, damage can occur due to stresses which develop during welding of flanged specimens. Barring damage beforehand, fatigue performance of cross stressed assemblies is independent of the presence of inclusions. This behavior is illustrated by the ultrasonic detection of inclusions in specimens and by measurements of crack propagation velocity.

13F. Ground Transportation Equipment

AD-A109 393/9 PC **A02**/MF **A01**
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
Urban Traffic Signal Control for Fuel Economy. Part 2. Extension to Small Cars (Economie D'Essence Grace a la Commande des Feux de Circulation en Zone Urbaine. Partie 2. Application aux Vehicules de Petite Cylindree),
G. S. Messenger. Nov 81, 13p DME-ME-249, NRC-19846
See also AD-A082 825. Summary in French.

Use of a small car's characteristics in a simulation program utilizing velocity profiles obtained in a traffic study by the Metropolitan Toronto Roads and Traffic Department and the Engine Laboratory at the National Research Council Canada has shown that trends shown in fuel consumption in NRC, Division of Mechanical Engineering Report No. ME-247 are similar for a small-engined vehicle. NRC, DME Report No. ME-247 showed that under the TRANSYT timing plan vehicles encountered fewer stops, saved time and used a slightly smaller amount of fuel than under the existing timing plan. In the above mentioned report, a large vehicle's fuel consumption was calculated using a computer model of the vehicle which used velocity profiles obtained from an instrumented floating car.

PB82-148958 PC **A10**/MF **A01**
General Motors Technical Center, Warren, MI. GM Transportation Systems Div.
System Operations Studies for Automated Guideway Transit Systems: Quantitative Analysis of Alternative AGT Operational Control Strategies.
Final rept. Jun 77-Jan 79,
Loren S. Bonderson. Oct 81, 204p DOT-TSC-UMTA-81-26, UMTA-MA-06-0048-81-6
Contract DOT-TSC-1220-1

The objectives of the Systems Operation Studies (SOS) for automated guideway transit (AGT) systems are to develop models for the analysis of system operations, to evaluate performance and cost, and to establish guidelines for the design and operation of ACT systems. This report documents analyses of the performance, cost, and operating characteristics of the functions of vehicle control, headway protection, longitudinal control, merge strategy, and dispatch strategy. Several options were defined for each control function and evaluated both analytically and through experiments of vehicle motion on link, merge, and intersection guideway elements at the subsystem level. Several specific control strategy combinations were also evaluated at the system level through AGT system simulations. The performance effect of vehicle entrainment both at stations and on the guideway was also evaluated at the system level. Alternative strategies/combinations were compared and guidelines were stated for choosing between control alternatives. The minimum operational headway analysis showed that the vehicle control and headway protection combination consisting of continuous moving block headway protection and fixed block vehicle follower vehicle control offers no advantage over the simpler combination using fixed blocks for both functions. In all cases, point follower control was found to require longer headway separation than vehicle follower control because of the focusing distance phenomenon during line speed changes.

PB82-149477 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Use and Effects of Seat Belts in 21 Countries,
Karin Berard-Andersen. Jan 78, 46p ISBN-82-7133-197-3

Through several years the positive effect of seat belt use has been documented. This report presents recent wearing rates and the latest documentation of the injury-reducing effect of seat belt wearing.

PB82-150426 PC **A06**/MF **A01**
Transportation Systems Center, Cambridge, MA.
The Effect of Light Truck Design Variables on Top Speed, Performance, and Fuel Economy, 1981.
Final rept. Oct 80-Sep 81,
R. W. Zub, and R. P. Meisner. Nov 81, 103p DOT-TSC-NHTSA-81-22, DOT-HS-806-047

The effect of vehicle weight, rolling resistance, aerodynamic drag, and drive-line configuration on fuel economy and performance for light duty trucks is examined. The effect of lockup and extended gear ratio range is also investigated. The assessment of these vehicle variables on fuel economy and performance is determined by using the Transportation Systems Center's vehicle simulation program, VEHSIM, which predicts fuel economy and performance for vehicle parameter changes. The results indicate fuel economy and performance trends which can be used to project future improvements.

PB82-151473 PC **A11**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Annotated Bibliography of Rail Transit Safety, 1975-1980, with Emphasis on Safety Research and Development.
Final rept. 1975-80,
Robert J. Pawlak, Robert M. Snow, and Marion E. Metcalf. Sep 81, 227p DOT-TSC-UMTA-81-56, UMTA-MA-06-0098-81-2
Contract DOT-UMTA-MA-06-0098

The bibliography provides a comprehensive review of published literature concerning rail transit safety and includes 186 annotated entries. The report covers domestic and foreign material on rail transit safety and related safety research and development. The Bibliography is concerned with safety aspects of the design and functioning of operating transit systems. Among the topics covered are train accidents (collisions, crashworthiness, derailments, and fires); evacuations; patron safety on and off trains; trespassers; and safety management. Because of its operational emphasis, the scope of this Bibliography does not include documents which deal exclusively with safety practices during facility construction, security against crime, or commuter rail.

PB82-152000 PC **A12**/MF **A01**
Wyle Labs., Colorado Springs, CO. Scientific Services and Systems Group.
Truck Design Optimization Project. Phase II: Type I Truck Test Results Report.
Technical rept. Apr-Sep 80,
David W. Gibson. Dec 81, 267p FRA/ORD-81/77
Contract DOT-FR-742-4277
See also PB82-152018.

The purpose of the Type I truck test program was to obtain performance data on Type I or conventional three-piece freight car trucks to characterize their operational behavior. One carset of 100-ton ASF Ride Control trucks was used with the 100-ton open hopper test car in all the series of tests. This report documents the Type I truck field test program. It describes: (1) the development of the measurement systems, (2) tests conducted, (3) data acquired, (4) samples of the type of information which can be extracted from the data, and (5) test plans and test procedures used. Data was collected in the performance regimes of curving negotiation, lateral stability, trackability, and ride quality. Tests were also conducted to obtain rolling resistance as part of the fuel consumption study.

PB82-152018 PC **A14**/MF **A01**
Wyle Labs., Colorado Springs, CO. Scientific Services and Systems Group.
Truck Design Optimization Project. Phase II: Type II Truck Test Results Report.
Technical rept. Apr-Dec 80,
Richard A. Peacock, and David W. Gibson. Dec 81, 313p WYLE/C-901-0012-A, FRA/ORD-81/78
Contract DOT-FR-742-4277
See also PB82-152000.

The purpose of the Type II Truck Test Program was to obtain performance data on several Type II (or premium) freight car trucks in order to characterize their operational behavior. Data were acquired in the performance regimes of curve negotiation, lateral stability, trackability, and ride quality. Tests were also conducted to obtain rolling resistance data as part of the fuel consumption study. Data on the Longitudinal coupler forces were used to compare the relative ability of various trucks to reduce rolling resistance and flanging forces, thus improving fuel consumption. The test program was designed to provide direct comparison measurements, wherever possible, with the Type I Truck tested earlier in TDOP Phase II. Seven Type II trucks were tested over the same test zones used during Type I testing. This report documents the changes to the instrumentation and equipment developed for Type I testing which were made for testing Type II trucks. Descriptions of the testing of each truck are presented, as are the procedures for data acquisition and reduction. Additionally, the report contains five appendices: Wheelset Calibration Data, Bearing Adapter Calibration Data, Type II Truck Test Plan and Procedure, Data Reduction Equations, and Transducer Location Measurement Data. The performance data gathered during testing will be used to formulate performance specifications for Type II trucks.

PB82-153149 PC **A20**/MF **A01**
California Univ., Berkeley. Dept. of Civil Engineering.
Contact-Impact Problems. Volume 1: Engineering Report and User's Manual.
Final rept. Jul 76-Dec 78,
R. L. Taylor, and J. L. Sackman. Aug 80, 463p UCSESM-78-4-1, DOT-HS-805 629
Contract DOT-HS-6-01443
Portions of this document are not fully legible.

The study report describes mathematical models for predictive purposes in crash-injury studies. Previous work in this area is extended and new developments are incorporated into a finite-element program for the analysis of biomechanical contact-impact problems.

PB82-153586 PC **A04**/MF **A01**
Calspan Corp., Buffalo, NY.
Characterization of Tire Wear Particulates.
Final rept. Feb 79-Apr 80,
Leonard Bogdan, and Thomas M. Albrechcinski. Nov 81, 72p EPA-460/3-81-036
Contract EPA-68-03-2781

This report describes results from laboratory test conditions to collect and characterize tire wear particulates as produced by the operation of passenger car tires. The tests were performed on a single radial tire (DR78-14) and a single bias tire using the capabilities of the Calspan Tire Research Facility (TIRF) that features a flat test surface consisting of a coated steel belt that simulates the friction properties of actual road surfaces. Tires were also tested under typical load and inflation pressure conditions. The general conclusions were: (1) Airborne rubber particulates were produced in an extremely small quantity, (2) The bulk of the collected airborne particulates were identified as contaminant debris, (3) Tests on the radial tire produced a particle size distribution with a medium particle diameter about one-half of that produced by identical tests on the bias tire.

PB82-804071 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Motor Vehicle Tires: Skid and Wear Resistance; Nondestructive Tests; Safety. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 281p
Supersedes PB80-815079, and NTIS/PS-79/0982.

Skid resistance and wear qualities of vehicle tires are investigated in these Government-sponsored research reports. Nondestructive test methods are evaluated, as well as the extent of compliance with Federal Safety Standards of foreign and domestic tires. (This updated bibliography contains 274 citations, 30 of which are new entries to the previous edition.)

PB82-804089 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Motor Vehicle Tires: Skid and Wear Resistance; Nondestructive Tests; Safety. 1970-1981 (Citations from the Engineering Index Data Base).
Jan 82, 121p
Supersedes PB80-815087, and NTIS/PS-79/0983.

Skid resistance and wear qualities of vehicle tires are investigated in these reports from a worldwide literature survey. Nondestructive test methods are evaluated. (This updated bibliography contains 114 citations, 8 of which are new entries to the previous edition.)

13G. Hydraulic and Pneumatic Equipment

PB82-862608 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Axial Flow Compressors. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 147p
Supersedes PB80-808611.

This bibliography contains citations concerning axial-flow compressors used in jet engines, gas turbines, torbofans, centrifuges, and other turbomachinery. Design (including blades and rotors), materials, performance, and applications are considered. (This updated bibliography contains 157 citations, 34 of which are new entries to the previous edition.)

PB82-862616 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Axial Flow Compressors. 1974-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1974-Feb 82.
Feb 82, 338p
Supersedes PB80-808603.

This bibliography contains citations concerning axial-flow compressors used in jet engines, gas turbines, turbofans, centrifuges and other turbine machinery. Aerodynamic characteristics, energy transfer and evaluations as they apply to design, materials, performance and applications are included in the topics considered. (This updated bibliography contains 293 citations, 93 of which are new entries to the previous edition.)

13H. Industrial Processes

AD-A109 415/0 PC **E13**/MF **E13**
Battelle Columbus Labs., OH. Metals and Ceramics Information Center.
Technological Advances in Joining,
H. E. Pattee. Aug 81, 84p Rept no. MCIC-81-43
Contract DLA900-78-C-1715

No abstract available.

N82-14353/8 PC **A12**/MF **A01**
Centre Technique des Industries Mecaniques, Senlis (France).
Ionic Treatment of Tools and Gears Traitement Ionique des Outillages et Engrenages.
Final Report.
A. Dubus, J. P. Peyre, M. Gantois, H. Michel, and C. Leroy. 30 Sep 80, 265p CETIM-12-G-129
Text in French.

Ionic nitriding was studied. The diffusion layers were quantitatively and microstructurally analyzed. The fundamental mechanisms which govern the in situ transformation of sulfur carbides into nitrides and lead to the precipitation of cementite lattices are defined. Optimization of the treatment parameters allows for the realization of single-phase layers on Z 155 CDV 12 steel. This phase transformation conditions the mechanical resistance of the nitrided layers. Wear test results indicate that for tool steels, the choice of nitriding treatment must be specific to the intended application.

N82-14404/9 PC **A03**/MF **A01**
Centre de Recherches Scientifiques et Techniques de l'Industrie des Fabrications Metalliques, Brussels (Belgium).
Scientific and Technical Research Activities Report in Industrial Fabrication Rapport Annuel du Comite Permanent au Conseil General.
Annual Report, 1980.
10 Jun 81, 39p
Text in French.

Activities in heavy construction and industrial research were reviewed. Foundry works, metal industry, and construction are discussed. Fabrication of mechanical and electrical devices as well as industrial automation and data processing are described. The use of plastics is also dealt with.

N82-14527/7 PC **A03**/MF **A01**
Societe Nationale Industrielle Aerospatiale, Suresnes (France). Lab. Central.
Control Methodology: Nondestructive Testing in the Aeronautics Industry Methodologie de Controle: Controle Non Destructif Domaine Aeronautique.
J. Odorico. 12 Jun 80, 39p SNIAS-812-551-110
Text in French. Presented at l'Ecole d'Ete Franco-Quebecoise Conf., Montreal, 14-23 Jul. 1980.

Quality control in aircraft production using nondestructive tests is considered. Training and administration are covered. Examples of procedures involving suppliers, constructors, and clients are given. Topics include: use of X-rays; holography; examination of alloys; and ultrasonic testing. The need for an integrated approach is stressed, involving client, inspectors, etc.

N82-14530/1 PC **A03**/MF **A01**
Rohr Industries, Inc., Chula Vista, CA.
Fabrication of Titanium Multiwall Thermal Protection System (Tps) Curved Panel.
Interim Report.
W. Blair. Aug 81, 29p NASA-CR-165754
Contract NAS1-15646

A method is described for fabricating curved T1-6Al-4V multiwall panels having a single radius of curvature of 30.5 cm (12 inches). A panel 30.5 x 30.5 x 1.7 cm (12 x 12 x .688 inch) having 4 dimpled sheets, 5 undimpled sheets, and stepped side closures was designed, fabricated and delivered for evaluation. Tool design for skin and dimpled sheet forming are described as well as layup and liquid interface diffusion bonding.

PB82-151382 PC **A11**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Sea Grant Coll. Program.
Development of Joining and Cutting Techniques for Deep-Sea Applications,
Koichi Masubuchi. Jun 81, 230p MITSG-81-2, NOAA-81102107
Grant NA79AA-D-00101

This is the final report of a four-year research program covering the following tasks: (1) Evaluation of various joining and cutting techniques for deep-sea applications; (2) Construction of a pressure tank; (3) Experiments on arc welding and cutting under simulated deep-sea conditions; (4) Continued experiments on arc welding and cutting in deep-sea conditions; (5) Design of prototype tools for underwater welding and cutting in deep-sea conditions; (6) Test of prototype units under simulated deep-sea conditions; and (7) Operational characterization of deep-sea construction and repair. Efforts also have been made to develop an integrated, fully automated welding machine using the flux-shielded process.

PB82-804030 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Diffusion Bonding. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 299p
Supersedes PB80-815236, and NTIS/PS-79/0988.

The processing, metallurgical techniques, diffusion phenomena, bonding mechanisms, and mechanical properties of diffusion bonded joints are investigated in the cited reports. Materials bonded include stainless steels, refractories, titanium, dissimilar metals, composites, reactor fuels, and silicon wafers. (This updated bibliography contains 275 citations, 7 of which are new entries to the previous edition.)

PB82-858952 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Alloy Electrodeposition. January, 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for Jan 76-Feb 82.
Feb 82, 96p
Supersedes PB81-852642.Prepared in cooperation with the Department of Energy, Washington, DC.

The electrodeposition of alloys is discussed in the cited reports, in terms of both composition and operating conditions necessary for the desired physical and mechanical properties of the plated coatings. Methods of chemical analysis are described which ensure the proper alloy composition. Emphasis is placed on wear resistant coatings. Both aqueous and fused salt electrolyte systems are described. (This updated bibliography contains 93 citations, 23 of which are new entries to the previous edition.)

PB82-861527 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Direct Numerical Control (DNC). 1973-February, 1982 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1973-Feb 82.
Feb 82, 73p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, D.C.

Articles cited in this bibliography discuss the methods, design, and implementation of direct numerical control (DNC) systems. Topics include a discussion of the application of DNC to such processes as aircraft parts production, three-dimensional surface machining, welding, and turbine manufacturing. The use of computers for DNC to make manufacturing systems more flexible and productive is also discussed. (Contains 91 citations fully indexed and includes a title list.)

PB82-862368 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Drafting Machines and Practice. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 178p
Supersedes PB80-808918.

This bibliography contains citations concerning computer-aided and standard drafting practices and machines. Standards, document generation, identification and filing systems, symbols, drafting techniques and interactive graphics are discussed. The use of computers in drafting and design is also considered. (This updated bibliography contains 221 citations, 79 of which are new entries to the previous edition.)

PB82-862384 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Isostatic Pressing. June, 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Feb 82.
Feb 82, 90p
Supersedes PB80-854094.

This bibliography cites reports relating to cold and hot isostatic pressing of metals. Methods for the isostatic forming of titanium, refractory, hard and high performance ferrous alloys are considered. Applications include turbine engine components, ceramic tools, and noncontact hot isostatic pressing of castings and powders. (This updated bibliography contains 91 citations, 32 of which are new entries to the previous edition.)

PB82-862558 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aging of Cobalt Base Alloys. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 161p
Supersedes PB81-859225.

The aging of cobalt base alloys is discussed in terms of the effects on magnetic properties as well as the accompanying effect on the physical properties of the alloys. Changes in structure, particularly phase transformations, are also discussed, as is precipitation hardening. Heat treatment procedures for the aging process are included. (This updated bibliography contains 126 citations, 23 of which are new entries to the previous edition.)

PB82-862582 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Titanium: Castings and Casting. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 121p
Supersedes PB80-809379.

This bibliography contains citations concerning the fabrication through casting of titanium and various titanium alloys. Hot isostatic pressing (HIP) and other densification techniques are described. A number of applications of cast titanium parts are included. (This updated bibliography contains 93 citations, 25 of which are new entries to the previous edition.)

PB82-862780 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cryogenic Aging of Metals. 1975-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1975-Feb 82.
Feb 82, 220p
Supersedes PB80-808884.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the deterioration or failure of metals at low temperature. Superconductors, aircraft, arctic facilities, and other forms of metal exposure to extreme cold are discussed. Failure mechanisms, dynamics, and inhibitors or retardants are considered. Cryogenic aging of aluminum is considered in a separate bibliography. (This updated bibliography contains 238 citations, 101 of which are new entries to the previous edition.)

13I. Machinery and Tools

N82-14502/0 PC **A03**/MF **A01**
Schenck (Carl) A.G., Darmstadt (Germany, F.R.).
Automatic Balancing System with Laser Unit.
Final Report.
A. Giers. Jan 81, 28p BMFT-FB-T-81-008, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

A balancing plant for miniature rotor gyroscopes was developed, using a pulsed laser for material removal in order to perform the necessary measurements and balancing processes in one single operation. The plant, consisting of five units, is depicted and illustrated by graphs and photographs. The tests were intended to check the machine, to get experimental data, and to investigate the possibilities of this technology. As compared to conventional procedures, this automatic balancing process with laser compensation is rationalized, is faster, is cheaper, and provides a higher balancing quality. The test results confirm the system reliability as well as the process advantages.

N82-14518/6 PC **A02**/MF **A01**
Haas (Carl) G.m.b.H. und Co., Schramberg (Germany, F.R.). Geschaeftsbereich Strahltechnik.
Laser Tool: Pulsed Solid State Laser for Welding and Ablation of Material.
Final Report, Sep. 1979.
P. Seiler. Feb 81, 20p BMFT-FB-T-81-043, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

A system of lasers, focusing and viewing optics, control and power electronics, coolers and mechanical components, was designed. The incorporated Nd-glass pulsed lasers have pulse energies up to 100 Wsec and average output powers up to 100 W. The machines are used in precision and electrical engineering, mainly combined with industrial handling. Being ideally suited for automation, this method has a wide range of application in the field of spot and seam welding of small parts and is widely used to make electric contacts.

PAT-APPL-6-311 219 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Microprocessor Controlled Fiber Optic Cable Winding Machine.
Patent Application,
Michael E. Kono. Filed 14 Oct 81, 20p AD-D009 069/6
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

An apparatus and method is described for making a layered optical fiber coil assure that the fiber's structural integrity is not comprised. A supply spool pays out a length of optical fiber to a level wind mechanism that displaces the fiber in reciprocal lateral excursions and an adhesive coating is applied to the fiber before it is wound on a take-up spool. During each lateral excursion of the level-wind mechanism while the fiber is being wound on the take-up spool, the supply spool is rotated in a plane orthogonal to the axial extension of the payed-out optical fiber. When appropriate tensioning is introduced, the wound fiber on the take-up spool is held close together in successive layers by the adhesive to provide a unitized, layered fiber optic coil after curing the removal of the take-up spool.

PB82-151440 PC **A02**/MF **A01**
Centre Technique des Industries Mecaniques, Senlis (France).
The Monitoring of Machines: Preliminary Study on a Transmission Gear Case,
G. Garcin. Sep 80, 13p CETIM-15-J-041-PT-3
Trans. of mono. Surveillances des Machines, n.p., n.d. See also French version, N81-24481/6.

The application of vibration analysis to the surveillance of the mechanical condition of machines is proposed. A signal processing method, given vibration measurement data, is suggested. This method was validated using a wear test setup for studying the behavior of an automobile transmission to failure. The test bench is described, including type and frequency of measurements as well as measurement methodology. Results demonstrate the feasibility of diagnosing wear on machine parts through the statistical analysis of associated vibration signatures.

PB82-862038 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cemented Carbide Metal Cutting Tools. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 216p

Citations in this bibliography include evaluations and applications of cemented carbide machine tool technology. The effects of high cutting speeds on the crater wear of cemented carbide cutting tools, grinding cemented carbides with diamond grinding wheels, microstructure study of cemented carbides via metallographic methods, and mechanical properties of cemented carbides under elevated temperatures generated by excessive abrasion are among the subjects discussed. Innovations in carbide cutting tools relative to coatings and cemented cobalt, nickel and titanium carbide base materials for increased material removal rates are also included. (Contains 249 citations fully indexed and includes a title list.)

PB82-862723 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Welding Machines. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 137p
Supersedes PB81-858615.Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography discuss welding machine and accessory technology. Computer remote-controlled pipe-welding operations, welding equipment design innovations for welding a connection line to an electrode of a solar cell, mobile power plants for welding at field locations, nuclear tube welding developments, electron-beam welding technology, and heating with welding transformers for energy-saving industrial applications are among the topics included in this bibliography. Health hazards from high voltage welding equipment are also discussed. (This updated bibliography contains 141 citations, 19 of which are new entries to the previous edition.)

PB82-862731 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Welding Machines. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 84p
Supersedes PB81-858607.

Reports are cited which discuss design innovations and applications of welding machines and accessories. Electron-beam and laser-beam welding methods and equipment, remotely operated welding machines, underwater welding machine developments, and computer automated welding machine processes are discussed. The design and manufacture of electron welding guns, and the development of smart welding machines are included. (This updated bibliography contains 76 citations, 13 of which are new entries to the previous edition.)

13J. Marine Engineering

AD-A108 773/3 PC **A09**/MF **A01**
Lockheed Missiles and Space Co., Inc., Palo Alto, CA.
The Underwater Shock Analysis Code (USA-Version 3): A Reference Manual.
Final rept. 1 Mar 78-15 Sep 80,
J. A. DeRuntz, T. L. Geers, and C. A. Felippa. 15 Sep 80, 197p LMSC-D777843, DNA-5615F
Contract DNA001-78-C-0029

This report constitutes a reference manual for the third version of the Underwater Shock Analysis (USA) Code, a computer program for calculation of the transient response of a totally or partially submerged structure to a spherical shock wave of arbitrary pressure profile and source location. The code considers the structure to be linear-elastic and treats the surrounding fluid as an infinite acoustic medium. A discrete-element (finite-element, finite-difference) computational model is used for the structure, while the computational model for the fluid is based upon either of the Doubly Asymptotic Approximations. (Author)

AD-A108 815/2 PC **A04**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Ship Performance Dept.
Rough Water Performance of High Length to Beam Ratio Planing Boats,
E. E. Zarnick, and C. R. Turner. Jul 81, 71p Rept no. DTNSRDC/SPD-0973-01

Experiments were conducted in waves with several constant deadrise models to assess the rough water performance of high length to beam ratio planing craft. Several models with L/b = 7 and one with L/b = 9 were run in waves to determine the effects on performance of basic design parameters such as speed length ratio, loading coefficient, wave height to beam ratio, deadrise angle, trim angle and length to beam ratio. Charts have been prepared for estimating the pitch and heave motions, vertical accelerations and added resistance in waves of the high L/b craft. Two problems encountered with the models which may present obstacles in the design of high length to beam ratio craft were the extremely high impact loads as indicated by the high impact accelerations and, large quantities of water over the deck resulting from the bow plowing through wave crests. (Author)

AD-A108 885/5 PC **A05**/MF **A01**
Construction Technology Labs., Skokie, IL.
Inspection Guide for Reinforced Concrete Vessels. Volume 1. Inspection Guide.
Final rept.,
A. E. Fiorato, and L. S. Johal. Oct 81, 77p USCG-M-11-81-VOL-1
Contract DOT-CG-832171-A
See also Volume 2, AD-A108 912.

This guide provides a check list for use by U.S. Coast Guard Marine Inspectors in the inspection of reinforced concrete vessels. It provides itemized requirements to insure quality of newly constructed vessels and proper maintenance of in-service vessels. Topics covered include materials, batching and mixing, inspection before concreting, inspection during concreting, inspection after concreting, testing hardened concrete, in-service inspection, and repairs. (Author)

AD-A108 911/9 PC **A10**/MF **A01**
Lockheed Missiles and Space Co., Inc., Palo Alto, CA.
Underwater Shock Analysis of Nonlinear Structures: A Reference Manual for the USA-STAGS Code (Version 3).
Final rept. 1 Mar 78-9 Dec 80,
J. A. DeRuntz, and F. A. Brogan. 9 Dec 80, 212p
LMSC-D779760, DNA-5545F
Contract DNA001-78-C-0029
Revision of Report dated Feb 78. See also AD-A108 773.

This report is a reference manual for the third version of the USA-STAGS Code that calculates the nonlinear transient response of a totally or partially submerged structure to a spherical shock wave of arbitrary pressure profile and source location. USA-STAGS is the result of interfacing USA (Underwater Shock Analysis) and STAGS (Stress Analysis of General Shells). The fluid is assumed to be an infinite acoustic medium whose response to motions of the structure is described by either of the Doubly Asymptotic Approximations, DDA1 or DDA2. (Author)

AD-A108 912/7 PC **A07**/MF **A01**
Construction Technology Labs., Skokie, IL.
Inspection Guide for Reinforced Concrete Vessels. Volume 2. Commentary.
Final rept.,
A. E. Fiorato. Oct 81, 142p USCG-M-11-81-VOL-2
Contract DOT-CG-832171-A
See also Volume 1, AD-A108 885.

This report provides background material on design and construction of reinforced concrete vessels. Topics covered include historical background; design and construction considerations; materials; batching and mixing concrete; placement of formwork, reinforcement, and embedments; transporting, and placing concrete; curing concrete; evaluation of concrete strength; post-tensioning and grouting; precast concrete; in-situ testing of hardened concrete; and guidelines for inspection.

AD-A109 269/1 PC **A03**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
A Ray Theory for Nonlinear Ship Waves and Wave Resistance.
Final rept.,
Bohyun Yim. Dec 81, 26p Rept no. DTNSRDC-81/095
Presented at the International Conference on Numerical Ship Hydrodynamics (3rd), Paris, 16-19 Jun 81.

Analytical and numerical methods for application of ray theory in computing ship waves are investigated. The potentially important role of ray theory in analyses of nonlinear waves and wave resistance is demonstrated. The reflection of ship waves from the hull boundary is analyzed here for the first time. When a wave crest touches the ship surface, the ray exactly follows the ship surface. When the wave crest is nearly perpendicular to the ship surface the ray is reflected many times as it propagates along the ship surface. Many rays of reflected elementary waves intersect each other. The envelope to the first reflected rays forms a line like a shock front which borders the area of large waves or breaking waves near the ship. For the Wigley hull, ray paths, wave phases, and directions of elementary waves are computed by the ray theory and a method of computing wave resistance is developed. The wave phase is compared with that of linear theory as a function of ship-beam length ratio to identify the advancement of the bow wave phase which influences the design of bow bulbs. The wave resistance of the Wigley hull is computed using the amplitude function from Michell's then ship theory and compared with values of Michell's wave resistance. The total wave resistance has the phase of hump and hollow shifted considerably. (Author)

AD-A109 328/5 PC **A03**/MF **A01**
Stevens Inst. of Tech., Hoboken, NJ. Davidson Lab.
Experimental Study of SWATH Model Rolling in Beam Waves.
Final rept. Sep 79-Aug 81,
Edward Numata. Aug 81, 34p Rept no. SIT-DL-81-9-2200
Contract N00014-79-C-0950

Experiments were conducted with a model of a single-strut-per-hull SWATH ship and three variants (Higher GM, Wide Spacing, Deep Draft) at zero speed in beam regular and irregular waves. Each model configuration tended to roll at its natural frequency omega when excited by regular waves with a frequency 2 omega, or by irregular waves with a modal frequency of 2 omega. (Author)

AD-A109 375/6 PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Ventilation Controlled Fires: Smoke Obscuration and Venting in Cable Fire Tests.
Final rept.,
Raymond S. Alger, Frank I. Laughridge, Walter H. Johnson, and Daniel D. Lee. Feb 81, 33p
Contract N00173-80-C-0144

The U.S. Navy has accumulated over 211 years of experience coping with ship fires. Despite this history and a strong tradition of fire fighting, some of the simple questions about fire characteristics and the suppression of compartment fires still defy the experts. This report is concerned with three of these areas of uncertainty. How do fires in forced ventilation compartments behave when extemporaneous holes are introduced in the bulkheads and/or decks by enemy action or the efforts of fire fighters trying to ventilate the space or apply an agent to the fire. When should ship compartment fires be sealed and when should they be ventilated to remove smoke and heat so the firemen can reach the seat of the fire. How do smoke and the hot combustion products behave during fire suppression efforts with water, particularly how do drop size and spray pattern disturb the fire environment and alter the thermal insult experienced by the fire fighters.

PB82-148495 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Marine Accident Report: Grounding of the U.S. Sailboat MR. B Near Punta Chivata, Mexico, November 25, 1981.
9 Dec 81, 32p NTSB-MAR-81-13

On November 25, 1980, a 22-foot United States sailboat, the MR. B, grounded near Punta Chivata, Mexico, in the Golfo de California. The MR. B was one of five boats participating in a juvenile delinquent rehabilitation program sponsored by Vision Quest National, Limited of Tucson, Arizona. Three of the nine persons aboard the boat died; the other six are missing and presumed dead. The estimated loss of the boat was $7,000. The National Transportation Safety Board is unable to determine the cause of the MR. B being wrecked on a lee shore because there were no survivors and no distress signal was seen or heard. Contributing to the accident was the operation of the MR. B for over 44 continuous hours by an operator with limited experience and the lack of a qualified person to relieve him. Contributing to the loss of life was the failure of the expedition leader to establish adequate procedures for maintaining visual contact with the MR. B at all times.

PB82-148651 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
Progress in Underwater Telemanipulator Research,
Norman Doelling. Jul 81, 29p MITSG-81-4, OPPORTUNITY BRIEF-23, NOAA-81102109
Index No. 81-604-Mni.

As a long-term goal, research activities at MIT and at the Naval Ocean Systems Center are directed toward the construction and operation of an underwater, unmanned, untethered telemanipulator. This ideal aim, which may or may not be achieved, helps to focus research on all the significant problems that might attend lesser objectives. Work has focused on three activities. First, there has been the joint effort to design, develop, and construct the NOSC manipulator and its supervisory control system. Supervisory control system hardware consisting of two PDP-11/23 computers, one on the surface and one on the remote vehicle, has been purchased. Appropriate interface systems have been designed and developed. A second effort has been devoted to improving the hardware and software for the supervisory control system of MIT's laboratory manipulators. With the improvements, extended experiments on supervisory control can be carried out. In the third major effort, observation and manipulation activities in the sea have been simulated through the use of a small vehicle that carries a video camera around the MIT man-machine laboratory.

PB82-151358 PC **E02**/MF **E02**
National Maritime Inst., Feltham (England).
Recent Developments in Marine Simulation,
J. A. H. Paffett. c1981, 25p NMI/R-109
This paper was presented at the Royal Institute of Navigation, London on 19 November 1980.

This paper first outlines the arguments for simulators for use in training and research. The technical problems encountered in simulating ship behavior are discussed, and the various engineering approaches which have been used for actual simulator constructed are described. An account is given of experience to date with ship simulators in the UK, and the future prospects for marine application of simulator methods are discussed. (Copyright (c) Crown Copyright, 1981.)

PB82-151366 PC **E04**/MF **E04**
National Maritime Inst., Feltham (England).
The GAUL Disaster: An Investigation into the Loss of a Large Stern Trawler,
A. Morrall. c1981, 54p NMI/R-121
This paper was presented at a meeting of the Royal Institution of Naval Architect on April 15, 1980.

Results are presented of an investigation into the loss of the mfv GAUL, a large modern stern trawler, which disappeared in heavy seas off the North Cape of Norway. The vessel appeared to have had adequate reserve of stability, especially compared with the minimum criteria recommended by IMCO. The findings of this investigation are consistent with the view that the GAUL was not lost as a result of inadequate intact stability or poor seakeeping qualities. It is concluded that the most probable cause of the loss was due to the effect of the severe waves and wind and the possibility of encountering a large steep wave or waves at that time in the area of the North Cape Bank in combination with some other unknown circumstances admitting water to the ship. (Copyright (c) The Royal Institution of Naval Architects, 1980.)

PB82-151895 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
The Engineering and Economics of Coal-Fired Ship Propulsion,
John B. Bidwell. Jul 81, 33p MITSG-81-7, OPPORTUNITY BRIEF-26, NOAA-81102112

New construction of coal-fired ships has been supported by studies and by placement of construction orders. Recognizing that a transition period will be necessary, studies underway at MIT are currently examining the more difficult case of converting existing ships from oil to coal-fired. The economic attraction of saving on fuel costs must be sufficiently large to compensate for diminished cargo space and increased weight in bunkers and machinery, as well as capital cost of conversion. These studies examine thermodynamic and mechanical problems of carrying out such a conversion. An economic comparison has been embodied in computer programs which have been run with today's prices and with projected prices of the two fuels. These studies show an economic incentive to convert existing ships to coal-firing, particularly for ships with high fuel costs. The minimum size of ship that spends a large proportion of its time at sea and carries low value cargo, such as bulk carriers and tankers, for which conversion would currently be profitable is 70,000 DWT.

PB82-152315 PC **E02**/MF **E02**
National Maritime Inst., Feltham (England).

Monitoring the Tow-Out of the NMI Christchurch Bay Tower, (10 April 1978).
A. E. Wills. c1981, 15p NMI/R-107, OT-R-8134

As part of a larger study of the towing characteristics of large structures an attempt was made to monitor the required towing forces and speed through the water of the Christchurch Bay Tower during the tow from Southampton Water to Christchurch Bay on 10 April 1978. The attempt was largely unsuccessful for a number of reasons which are discussed. A small amount of useful information was obtained and possibly a lot can be learned from the difficulties encountered. The Christchurch Bay Tower is a monolithic research structure having a 20 m diameter reinforced concrete base and a 2.8 m diameter central tower structure. A 0.7 m deep, 20 m diameter sand penetration sheet piling skirt protrudes below the base. The tower was assembled ashore at Calshot and towed to its present position in Christchurch Bay. It was made buoyant for the tow by adding a caisson constructed in such a manner that the tow was effectively a vertical cylinder 20 m diamter with a draught of 3.85 m. (Copyright (c) Crown Copyright, 1981.)

PB82-152323 PC **E02**/MF **E02**
National Maritime Inst., Feltham (England).
On the Validation of Radar Simulator Results,
R. G. Curtis, and M. J. Barratt. c1981, 20p NMI/R-105
Presented at the Royal Inst. of Navigation, London, and published in the Jnl. of Navigation, v34 p187 1981.

When measurements and observations are made using a radar simulator, the researcher assumes that mariners behave in the same way, whether they are handling a simulator or a real ship. This paper investigates whether this is a reasonable assumption. (Copyright (c) Crown Copyright, 1981.)

PB82-152356 PC **E03**/MF **E03**
National Maritime Inst., Feltham (England).
Responses to Slowly Varying Drift Forces and Their Sensitivity to Methods of Wave Spectral Modelling: A Preliminary Assessment,
N. M. C. Dacunha, N. Hogben, and R. G. Standing. c1981, 27p NMI/R-101, SMT-R-8103

It has long been recognized that the responses of moored systems can be very sensitive to differences in methods of spectral modelling. There are various reasons for this and the present report is a preliminary study concerned particularly with the effects of the spacing of the discrete frequencies or spectral lines associated with the finite repeat periods which characterize laboratory simulations of sea waves. An assessment of these effects and the related influence of spectral comparisons with experiment. The analytical results demonstrate the sensitivity of the responses and lead to suggested criteria for acceptable line spacing. In discussing this assessment, attention is drawn to other factors which could well also be important such as phase correlation and associated wave grouping. The need is also emphasized for further research aimed at ensuring that model experiments can reliably predict the responses of full scale systems in the real sea. (Copyright (c) Crown Copyright, 1981.)

PB82-152992 PC **A03**/MF **A01**
Statens Skeppsprovningsanstalt, Goeteborg (Sweden).
A Design Method for Wake Vorticity Adapted Propellers in a Frictional Wake,
Gilbert Dyne. Feb 81, 27p SSPA/PUB-91, ISBN-91-38-06251-8
Also pub. as ISSN-0373-4714.

In this report the ideas presented in 2 previous reports are developed further and a design method for wake vorticity adapted propellers in a frictional wake is presented. The method is used to demonstrate how different parameters influence the radial distribution of effective wake and blade pitch and a comparison is made with earlier methods. Finally, the reason for the difference between the volumetric mean effective wake calculated by the new method and the Taylor wake determined by the thrust identity method is discussed.

PB82-153164 PC **E05**/MF **E05**
National Maritime Inst., Feltham (England).
Cavitation Induced Hull Pressures Measured in a Water Tunnel for Comparison with Ship Trials on a Single Screw Cargo Carrier,
K. G. Poulton, H. Ritter, M. E. Davies, and G. E. Gadd. c1981, 77p NMI/R-114, SMT-R-8107

The reports produced as a result of the program 'Propeller Hull Interactive Vibration Excitation', (PHIVE), which was carried out jointly by NMI and BSRA from 1977 to 1980, included comparisons between experiments in the water tunnel and full-scale trials on two ships. One was a 55,000 ton d.w. products tanker (PEV69), the other a 21,000 ton d.w. multiflex cargo carrier (PEV70). In both, the hull pressures produced by a cavitating propeller were measured and the cavitation photographed. The aim of these comparisons was to show the extent to which model measurements could serve as a prediction of the ship's behavior. It was concluded that the prediction of ship trial results from such tests is still in need of improvement. Although the reliability of identifying a bad hull/propeller combination is fairly high with regard to blade rate fluctuations, there is still too much uncertainty about the magnitude of the harmonics. This appears to be caused firstly by inadequate representation of the wake field and secondly by complicated scale effects in the cavitation dynamics. These conclusions are exemplified by the case of Ship PEV70 which showed excessive vibration during the builder's trials in ballast draught so that some modifications became essential. To reduce the ship's vibration, flow deflector fins - also called vortex generators - were fitted near the stern. The choice of this vessel as the object of further water tunnel studies offered additional scope for studying the problems of model scale simulation. Firstly the lack of warning of trouble from the original tunnel measurements could be investigated by repeat tests and secondly an attempt could be made to duplicate in the tunnel the benefit derived from the flow deflectors on the ship, which in turn demanded an extension of the modelling capability to deal with a hull fitted with such auxiliary surfaces. (Copyright (c) Crown Copyright, 1981.)

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

PATENT-4 300 723 Not available NTIS
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Controlled Overspray Spray Nozzle.
Patent,
W. P. Prasthofer. Filed 29 Feb 80, patented 17 Nov 81, 6p N82-13376/0, PAT-APPL-6-126 138
Supersedes PAT-APPL-6-126 138, N80-20528 (18 - 11, p 1415).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

A spray system for a multi-ingredient ablative material wherein a nozzle A is utilized for suppressing overspray is described. The nozzle includes a cyclindrical inlet which converges to a restricted throat. A curved juncture between the cylindrical inlet and the convergent portion affords unrestricted and uninterrupted flow of the ablative material. A divergent bell-shaped chamber and adjustable nozzle exit B is utilized which provides a highly effective spray pattern in suppressing overspray to an acceptable level and producing a homogeneous jet of material that adheres well to the substrate.

PB82-143371 PC **A02**/MF **A01**
GCA Corp., Bedford, MA. GCA Technology Div.
Predicting Pressure Loss for Pulse Jet Filters.
Journal article,
Richard Dennis, John E. Wilder, and Dale L. Harmon. 1981, 8p
Contracts EPA-68-02-0268, EPA-68-02-1438
Pub. in Jnl. of the Air Pollution Control Association, v31 n9 p987-992 Sep 81.

The paper discusses the prediction of pressure loss for pulse jet filters. The analysis of pressure loss characteristics for the filters suggests that the relationship between dust adhesion to the fabric and the opposing force generated by pulse jet action plays a major role in dust removal. Hence, fabric cleanability is examined in terms of the adhesion/cohesion forces bonding the dust to the fabric vs. the intensity and frequency of the dust dislodgement forces produced by the high energy air pulses. The effect of jet size and location, jet air volume, and the intensity (pressure) and duration of the jet pulses is related to operating pressure loss. The mechanics of energy transfer from the jet pulse to the dust-laden fabric are explored in terms of jet pressure, solenoid valve action, the ratio of delivered pulse air volume to bag (tube) volume, and the elastic and flex properties of the felt bags. Effective and actual fabric dust holdings before and after cleaning are discussed with respect to steady-state dust deposition and removal rates, and operating pressure losses. Finally, predictive equations are proposed for estimating pressure loss over a broad range of design and operating parameters.

PB82-151507 PC **E03**/MF **E03**
National Water Council, London (England).
Flexible Joints for Gravity Sewers.
Occasional technical paper no. 3,
R. P. Hardy. c1979, 28p ISBN-0-904561-51-8
Errata sheet inserted.

This report provides information on the various forms of 'flexible' joints for sewer pipes sealed with a ring made from an elastomeric (rubber like) material. The joint assembly should be watertight and be able to withstand the aggressive attack of soils, sewage and trade effluents. It should also retain sufficient elasticity to accommodate the long term movements of pipelines.

PB82-861493 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thin Walled Structures. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 211p

This bibliography cites articles concerned with testing, manufacturing, analysis, and modeling of thin walled structures, including beams, cylinders, girders, domes, shells, tubes, pipes, and containers. The structural materials discussed are fibrous thermoplastics, elastoplastics, concrete, and metals. The testing of thin walled structures is discussed under thermal stress, pressure, and various loading environments. (Contains 226 citations fully indexed and includes a title list.)

PB82-861865 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fuel Pump Applications. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 93p
Supersedes PB81-858839.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations on the design, construction, and applications of fuel pumps. Pumps for use with diesel fuels, gasoline, and various liquid gases are discussed. Pressure distribution and constant flow control in pipelines are considered. (This updated bibliography contains 87 citations, 8 of which are new entries to the previous edition.)

PB82-862426 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Vacuum Pumps. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 127p
Supersedes PB81-859308.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerned with the design, construction, and applications of vacuum pumps in industrial, commercial, and space technology. Among the topics included in this bibliography are energy conservation of various vacuum pump designs, ultra-high vacuum pump utilization, and turbomolecular pump design and applications. Performance evaluations of modern vacuum pumps under various conditions are also examined. (This updated bibliography contains 123 citations, 14 of which are new entries to the previous edition.)

PB82-862434 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Vacuum Pumps. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 218p
Supersedes PB81-859282.Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography include innovations in vacuum pump technology relative to industrial, commercial, and space applications. Vacuum pumping for controlled thermonuclear reactors, vacuum engineering for fusion research and fusion reactors, energy consumption rates of diffusion pumps, and vacuum pump function in solar heat energy transfer systems are included. Computerized vacuum measuring, monitoring, and control are examined and evaluated. (This updated bibliography contains 228 citations, 43 of which are new entries to the previous edition.)

13L. Safety Engineering

N82-14524/4 PC **A05**/MF **A01**
Institut de Soudure, Paris (France).
Study of Problems Posed by the Emission of Fumes During Welding Etude des Problemes Poses Par l'Emission de Fumees au Cours du Soudage.
Final Report.
Jan 81, 78p CETIM-12-Y-213, IS-7-989
Contract CETIM-4-76-2693
Text in French.

Application of a measurement method for sampling and analyzing dust in the fumes is described. Arc welding using a rutile coated electrode of painted sheet metal is characterized. Results show the instantaneous dust concentration to which a welder is subjected at his work station. The measuring equipment is depicted and its functioning is explained.

PB82-136268 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Technology.
Safety Report: Status of Department of Transportation's Hazardous Materials Regulatory Program.
29 Sep 81, 46p NTSB-SR-81-2

The Safety Board reviewed hazardous materials legislation and regulations promulgated by the Federal government, analyzed the DOT hazardous materials safety programs, and reviewed Safety Board reports on hazardous materials accidents and its recommendations for corrective actions. This report identifies reasons for past delays in implementing corrective society improvements by DOT and identifies changes needed in DOT's management of the hazardous materials transportation program to bring about more timely correction of identified safety hazards which is essential for reducing losses in life, injury, and property damage.

PB82-142043 PC **A03**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Improvements in Transportation Fire Safety Data Bases.
Final rept. Oct 80-Mar 81,
William T. Hathaway. Dec 81, 28p DOT-TSC-OST-81-7

The existing statistical data bases for transportation system accidents have been designed primarily to fulfill the modal administrative reporting functions. As such, the data collected are of a very broad nature and of limited use in the identification of areas of possible research and in the development and measurement of the effectiveness of regulatory action. This report identifies the design objectives which fire safety data bases should address, and provides recommendations for improvements in transportation fire safety data bases. A review of the available data bases containing information on transportation fires is presented in Reference 1.

PB82-142530 PC **A03**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Rail Transit Safety.
Annual rept. 1 Jan-31 Dec 80,
D. M. Daley, and E. T. Leonard. Sep 81, 35p DOT-TSC-UMTA-81-57, UMTA-MA-06-0098-81-1

The Rail Transit Safety 1980 Annual Report is a compendium and analysis of rapid rail transit (RRT) accident/incident and casualty statistics reported by 11 RRT proprties--Bay Area Rapid Transit District, Chicago Transit Authority, Greater Cleveland Regional Transit Authority, Massachusetts Bay Transportation Authority, Metropolitan Atlanta Regional Transit Authority, New York City Transit Authority, Port Authority Transit Corporation, Port Authority Trans-Hudson Corporation, Southeastern Pennsylvania Transportation Authority, Staten Island Rapid Transit Operating Authority, and Washington Metropolitan Area Transit Authority.

PB82-149469 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Drunken Driving in Norway,
Peter Christensen, Stein Fosser, and Alf Glad. May 78, 48p ISBN-82-7133-211-2

The report discusses drunken driving in Norway. The increase in accident risk for drunken drivers is calculated on the basis of data from roadside surveys and from studies of drivers injured and killed in accidents.

PB82-150269 PC **A03**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
The Control of Drunken Driving Accidents in Norway: An Uncertainty - Cross Section - Time Series Analysis,
Harold L. Votey, Jr. Nov 79, 40p ISBN-82-7133-281-3

The report contains a cross-section-time series analysis of the incidence and control of motoring accidents in Norway over a period of 6 years. The results support evidence from previous time-series analysis of the system of law enforcement in Norway that both drunken driving and fatal and serious injury accidents are deterred. However, the cost-benefit relationships for various law strategies need further analysis.

PB82-151721 PC **A05**/MF **A01**
Enviro-Management and Research, Inc., Washington, DC.
Soldering and Brazing Safety Guide: A Handbook on Safe Practice for those Involved in Soldering and Brazing.
1981, 89p
Contract PHS-HSM-99-73-33

A manual was prepared to provide those involved in welding and brazing with effective safety procedures for use in performance of their jobs. It is believed that in becoming familiar with those safety practices the workers will be able to understand and so avoid the frequent hazards associated with welding and brazing. Hazards exist in four types of general soldering and brazing processes: (1) cleaning; (2) application of flux; (3) application of heat and filler metal; and (4) residue cleaning. Most hazards during those operations can be avoided by using care, proper ventilation, protective clothing and equipment. Specific process hazards for various methods of brazing and soldering are treated. Methods to check ventilation are presented as well as a check of personal protective equipment. Personal hygiene and good maintenance practices are stressed. In addition, several emergency first aid treatments are presented.

PB82-153008 PC **A04**/MF **A01**
Fire Administration, Washington, DC.
Activities and Practices for Improving Fire Department Safety and Health Programs.
Dec 81, 68p FEMA-13

The purpose of this guide is to explain why firefighters must be supplied with adequate clothing, equipment, and breathing apparatus to protect them from the hazardous environments characteristic of their occupation. In addition, firefighters must become involved in health and physical fitness programs to help make them more capable of handling the physical requirements of firefighting.

PB82-153859 PC **A03**/MF **A01**
Fire Administration, Washington, DC.
Fire and Emergency Master Planning: Selected Bibliography on Master Planning.
Final rept.
Nov 81, 40p FEMA-15

This publication has been designed to provide guidance information that will enable the user to examine various benefits and aspects of master planning. The selected bibliography on Master Planning is divided into five major areas of concern to community leaders and fire service managers: master planning, management, prevention, suppression, and emergency response. Each division lists key articles and publications that range from general planning concepts to technical explanation of modern fire protection. Each entry is followed by a brief description of its contents and on its application to master planning. A list of publishers is also provided for ordering specific publications if desired.

PB82-153982 PC **A05**/MF **A01**
Fire Administration, Washington, DC.
Arson Task Force Assistance Program Anti-Arson Implementation Kits.
Apr 80, 85p FA-1, FEMA-09

This report is a 'how to' guide for implementing successful anti-arson programs. Topics include arson award ('tipster') programs, arson early warning systems, juvenile firesetter counseling programs, municipal arson task force programs, public education programs, and rural arson problems and solutions.

PB82-154048 PC **A13**/MF **A01**
Mission Research Corp., Santa Barbara, CA.
Municipal Fire Insurance Feasibility Analysis: Volume I--Analysis.
Final rept.
Oct 80, 286p MRC-R-588, FEMA-14
Sponsored in part by Institute for Local Self Government, Berkeley, CA.Portions of this document are not fully legible.

The publication is the result of a three year study of the feasibility of Municipal Fire Insurance funded by the U.S. Fire Administration of the Federal Emergency Management Agency (FEMA) and conducted by the Institute for Self Government (ILSG) and Mission Research Corporation (MRC). This publication describes the results of a very thorough and extensive study of the fiscal, legal and political feasibility of Municipal Fire Insurance.

PB82-156191 PC **A05**/MF **A01**
ACT Foundation, Basking Ridge, NJ.
The National Workshop for Fire Service EMS Needs: The Rockville Report December 3-5, 1979.
Final rept.
Feb 80, 86p FEMA-10, FEMA/FA-20
Grant FA-80016

This report, prepared by the ACT Foundation, cites the results of the Rockville Workshop held in December 1979. It constitutes a statement of progress and status of prehospital EMS in the fire service and prioritizes the 50 'needs' which the attendees felt were important. In addition, methods are recommended by which the U.S. Fire Administration (USFA) can meet, satisfy or eliminate those identified needs.

PB82-804105 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Firefighting. 1970-1981 (Citations from the Engineering Index Data Base).
Jan 82, 206p
Supersedes PB80-815160, and NTIS/PS-79/1015.

Firefighting techniques, equipment, and life support systems for firefighters are investigated in these cited reports. Methods for combating residential, shipboard, aircraft, and mine fires are researched. Protective clothing and breathing apparatus studies are included. (This updated bibliography contains 199 citations, 24 of which are new entries to the previous edition.)

13M. Structural Engineering

AD-A108 786/5 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Wood Joist Floors: Effects of Joist Variability on Floor Stiffness.
Forest Service research paper,
William J. McCutcheon, M. Daniel Vanderbilt, James R. Goodman, and Marvin E. Criswell. Sep 81, 23p
Rept no. FSRP-FPL-405

A theoretical study was conducted of the performance (deflection) of wood-joist floors subjected to distributed loads. Eleven 'benchmark' floors, typical of current construction practice, were analyzed. Results demonstrated that composite action, ignored by current design methods, can be substantial. Performance distributions were calculated for five floors from available joist stiffness data. Results showed that even when the joist stiffnesses are below design values, composite action reduces deflections to less than allowable design levels. The effects of joist variability on floor performance variations were studied by assuming distributions of joist stiffness, and calculating corresponding distributions of floor performance. Results demonstrate how joist variability is reduced when the joists are assembled into complete floor systems. The results of these analyses provide valuable data on the current performance levels of wood-joist floor systems, and the methodologies developed will be of benefit to future efforts in this area. (Author)

N82-14544/2 PC **A12**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Cologne (Germany, F.R.).
The Crack Growth Resistance Curve as a One-Parameter Representation of Stable Crack Propagation in Thin-Walled Structures.
Ph.D. Thesis - Ruhr Univ.
W. Setz. Oct 80, 268p DFVLR-FB-80-35, ESA-TT-727
In German; English Summary. Report Will Also Be Announced as Translation Esa-TT-727.

Tensile tests were performed on center cracked specimens with aluminum alloys. The effect of the variation in specimen width and the initial crack length growth resistance curve (R-curve) was investigated. The crack length was measured simultaneously by the potential and the compliance method. The potential method yields less scatter than the compliance method. The potential based R-curves were used to predict failure by the R-curve concept. The failure prediction for elastic plastic behavior supports a standard test method using R-curve measurements.

PB82-142209 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Calculation of Inter-Room Air Movement for Multi-Room Building Energy Analysis,
George N. Walton. Nov 81, 37p NBSIR-81-2404
Sponsored in part by Department of Energy, Washington, DC.

A model is presented for computing the infiltration and air flow between rooms of a multi-room building in terms of basic principles of fluid mechanics. This model has been incorporated into a comprehensive loads-predicting computer program. Air flows, room temperatures, and heating loads for a typical townhouse under different conditions of environment and with various construction features are computed. These calculations show the feasibility of detailed multi-room air movement analysis. They also indicate that when the inter-room openings of a low-rise structure are large compared to the envelope openings, the infiltration and total load can be accurately, and more quickly, computed by assuming no resistance to air flow between rooms. This property will also allow simplified calculations for high-rise buildings with many rooms. Methods are proposed for handling more complex air flow phenomena.

PB82-149048 PC **A06**/MF **A01**
Portland Cement Association, Skokie, IL. Construction Technology Labs.
Earthquake Resistant Structural Walls Analysis of Coupled Wall Specimens.
Final rept.,
T. Takayanagi, A. Scanlon, and W. G. Corley. Jul 81, 117p NSF/CEE-81067
Grant NSF-ENV77-15333

A structural model that can predict the response history and failure mechanisms of coupled wall systems under static loads is described. The analytical results are compared with test results for coupled wall specimens tested at the Construction Technology Laboratories. On the basis of this comparison, effects of assumed analytical conditions on overall behavior are discussed. The analytical results are in agreement with the experimental results with respect to overall behavior of the wall systems considered. It was demonstrated that analytical models can simulate important aspects of behavior of constituent members of coupled wall systems. The appendices include discussions on (1) development of member analytical models; (2) the assemblage of the structural stiffness matrix and calculation of failure mechanism formation; and (3) a static analysis of isolated structural walls.

PB82-149055 PC **A10**/MF **A01**
California Univ., Davis. Dept. of Civil Engineering.
An in situ Earth Reinforcement Lateral Support System,
C. K. Shen, L. R. Herrmann, K. M. Romstad, S. Bang, and Y. S. Kim. Mar 81, 205p 81-03, NSF/CEE-81059
Grant NSF-APR77-03944

An in situ reinforcement lateral support system which has been adopted primarily in western Canada, is composed of an array of reinforcing members that are grouted into the soil mass, a wire-mesh reinforced shotcrete panel facing, and rows of re-bars which form horizontal wales at each reinforcement level. An analytical procedure for evaluating the stability of the system is formulated and the stability analysis is verified by means of a centrifuge model. Studies are presented of the application of this system at the Good Samaritan Hospital and Medical Center in Portland, Oregon, and at the Davis campus of the University of California. The major factors controlling the stability and ground movement of the system were found to be the construction sequence, the soil type, the length, size, and spacing of the reinforcing members, and their orientation with respect to the horizontal ground surface. The system seems to be economical in construction time and cost, and is a viable alternative to more conventional methods for providing temporary support in deep excavation.

PB82-149832 Not available NTIS
National Bureau of Standards, Washington, DC.
Fire Safety and Disabled Persons.
Final rept.,
B. M. Levin, and H. E. Nelson. Sep 81, 6p
Pub. in Fire Jnl. 75, n5 p35-40 Sep 81.

The scope and nature of the problem of disabled persons in fire emergencies are discussed. Although specific solutions may need to be developed for particular disability types and occupancy settings, there are some principles which should be generally applied. These principles relate to general safety, methods of enabling disabled persons to meet their own safety needs, the role of others in providing assistance, and fire emergency planning. The options of evacuation or remaining in areas of safety are considered. An evacuation problem can result from the circumstance where a mobility impaired person has accessed upper floors of a building through use of an elevator, but cannot use this elevator for egress in a fire emergency. Efforts are underway to modify the Life Safety Code of the National Fire Protection Association to address this problem. Fire safety for disabled persons is discussed in the context of different occupancy types. There are currently no codes specifically established for one occupancy type, board and care homes. These homes may contain elderly, developmentally disabled, or emotionally impaired individuals. The National Bureau of Standards' effort to develop a fire safety evaluation system for this occupancy type is described.

PB82-151259 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Mechanical Performance of Built-Up Roofing Membranes.
Final rept.,
James M. Pommersheim. Dec 81, 63p NBS-TN-1152
Prepared in cooperation with Bucknell Univ., Lewisburg, PA.

For built-up roofing membranes with either linear or non-linear stress-strain behavior, fully bonded to an underlying deck or substrate which undergoes displacement, it is the equality of the complementary strain energy of the fabric or felt layer with the strain energy of the bonding adhesive or bitumen layer, which governs both the conditions under which membrane integrity is lost and the mode of failure by either membrane splitting or adhesive bonding. The testing criteria developed are applied to a sample case.

PB82-152521 Not available NTIS
National Bureau of Standards, Washington, DC.
Extreme Wind Speeds and Structural Failure Risks.
Final rept.,
Emil Simiu, James R. Shaver, and James J. Filliben. Nov 80, 15p
Pub. in Proceedings Conference Climate and Risk, Arlington, VA., May 27-29, 1980, Paper MTR-80W322-01, 1,p2-86--2-100 Nov 80.

A first objective of the paper is to describe recent NBS research results in the field of extreme wind climatology. These results include the finding that at most locations in the U.S. extreme wind speeds are described by probabilistic models with considerably shorter tails than the Extreme Value Type I distribution. Estimates of hurricane wind speeds along the Gulf and East coasts are presented, based on Monte Carlo simulation techniques used in conjunction with statistical data on the climatological characteristics of hurricanes. Also presented in the paper are estimates of member reliabilities that take into account the various uncertainties concerning the behavior of the member during its anticipated life. The dependence of such estimates upon the assumed probability distribution of the extreme wind speeds is discussed, and it is shown that current reliability estimates based on an Extreme Value Type I model of the extreme wind speeds appear to be unduly pessimistic.

PB82-153842 PC **A03**/MF **A01**
Fire Administration, Washington, DC.
High-Rise Fire Protection Procedures.
Dec 81, 29p FEMA-12, FA-56

This report has been compiled from a review of over 20 local high-rise operating procedures. It is not intended to serve as a 'how-to' manual for high-rise fire protection. It is intended to review some of the important issues in high-rise fire protection and provide a basis for reviewing and developing high-rise procedures at the local level.

PB82-154287 Not available NTIS
National Bureau of Standards, Washington, DC.
Comparisons of Calculated Hourly Cooling Load and Attic Temperature with Measured Data for a Houston Test House.
Final rept.,
Tamami Kusuda, E. T. Pierce, and J. W. Bean. 1981, 15p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in American Society of Heating, Refrigerating and Air-Conditioning Engineers Transactions 87, pt 1 p1185-1199 1981.

During the summer and autumn of 1977, NBS conducted attic ventilation experiments in three test houses in Houston, Texas. Hourly cooling loads were measured, together with indoor/outdoor climatic data, to allow precise comparison between the computer-simulated values with those measured values. In this paper, measured hourly cooling loads as well as attic temperature of one of the test houses were compared with those determined by the detailed heat balance simulation calculation used in NBSLD, the National Bureau of Standards heating/cooling load determination program. Measured cooling loads for a steady three-day period were also compared with those determined by two other public domain energy simulation programs, DOE-2 and BLAST-2.

PB82-156704 PC **A02**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Device for Controlling Settling of Pile-Driven Structures,
Manual Aguirre. May 81, 21p
Trans. of mono. Series del Instituto de Ingenieria de UNAM, Mexico City, n439 May 81.

The devices referred to in this paper have been developed for use as load control mechanisms in piles. These devices have the capacity to undergo large deformations (1.6 m) without having to be replaced, therefore they can offer a considerable advantage in regards to maintenance costs. Several of the devices were tested and the details and results of such tests are presented; also recommendations are given regarding design and construction of the devices to facilitate their application in high-rise buildings.

PB82-158494 PC **A09**/MF **A01**
Case Inst. of Tech., Cleveland, OH.
Reduction of Overturning Potential of Seismically Excited Structures.
Final rept.,

Arthur A. Huckelbridge, Jr., Robert M. Ferencz, and Shya-Ling Shein. May 81, 187p NSF/CEE-81076 Grant NSF-PFR78-08013

This report summarizes a study of the effects of large overturning moments on the seismic response of structures. In particular, the influence of allowing transient foundation uplift was examined, and more efficient computations methods to treat such localized nonlinearity were incorporated into an existing general analysis program. A variety of commonly used structural types and configurations were studied, including moment frames, braced frames, shear walls, and framed tubes. For the structures examined, transient foundation uplift was found extremely effective in limiting response parameters governed by, or related to, overturning effects. For structures which maintained reasonable levels of ductility demand within the superstructure there was little or no apparent loss in drift control associated with transient uplift. Response parameters not arising from overturning were not mitigated by transient foundation uplift. It was shown that story shears may be attributable to a significant degree to second or even higher mode response. The use of substructuring techniques was shown to be computationally attractive for treating locaiized nonlinearity such as transient foundation uplift.

PB82-804121 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Aided Design: Buildings. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 98p
Supersedes PB80-815046, and NTIS/PS-79/0965.

These abstracts delineate research performed in designing buildings by computer application. Energy conservation, environmental engineering, and structural integrity are among the design parameters investigated. (This updated bibliography contains 91 citations, 7 of which are new entries to the previous edition.)

PB82-861568 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Building Frames. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 163p

This bibliography contains citations concerned with the advantages and disadvantages of design variations in building frame structures. Wind load effects; earthquake and earth tremor response; gable frame truss support design for accommodation of various live loads; optimum design for rigidly joined building frames; and economics of construction framing members and materials are among the subjects discussed with reference to light-wood, ductile reinforced concrete, steel, multi-story shear wall frame and other building frame structures. Nondestructive testing methods and instrumentation are also considered. (Contains 174 citations fully indexed and includes a title list.)

PB82-861766 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Building Acoustics. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 210p

This bibliography contains citations on building acoustics and design innovations. Sound transmission through various composite wall panels; sound transmission classification system for rating building partitions; acoustic value of masonary, wood, and plastic compared and contrasted; and acoustic vibrational damage to structural components of buildings are among the topics included in this bibliography. Acoustic design regulations and codes are examined for public as well as residential buildings. (Contains 235 citations fully indexed and includes a title list.)

PB82-861808 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Multifamily Buildings: Structural, HVAC and Environmental Design Considerations. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 155p

This bibliography cites reports concerned with the HVAC systems of multifamily residential structures which include high-rise apartment buildings, cooperatives, condominiums and other multifamily housing structures. Among the topics discussed are energy conservation in the heating and hot water supply of multifamily houses using gas engine driven heat pumps, electric heat pumps, and gas-powered compression heat pumps; solar heating and cooling of multifamily buildings; heat loss calculation of multifamily compact housing structures; and characteristics of heating and cooling demands in apartment buildings. Building material selection criteria, solid waste handling systems, sound insulation and security systems relative to multifamily residential complexes are also discussed. (Contains 167 citations fully indexed and includes a title list.)

PB82-861832 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plastic Window Frames. 1978-February, 1982 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1978-Feb 82.
Feb 82, 158p

Citations in this bibliography include design innovations relative to plastic technology in the manufacture of window frames for the building industry. Manufacturing evaluation of extruded PVC as a replacement for wood window frame members, PVC window frame molding system, energy conservation of plastic window components compared to conventional wood window frames and aluminum extruded window frames, and molding of rigid polyurethane foam window frames are included. Manufacturing technology describing forming equipment, machinery and molding processes is also discussed relevant to the development of plastic window framing members. (Contains 207 citations fully indexed and includes a title list.)

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A108 871/5 PC **A04**/MF **A01**
Utah State Univ., Bedford, MA. Electro-Dynamics Labs. (SRL).
Aircraft-Borne Measurement of Infrared Sources and Backgrounds.
Final rept. 21 Oct 77-30 Jun 81,
Ronald J. Huppi. 30 Jun 81, 61p EDL-SRL-81-3, AFGL-TR-81-0199
Contract F19628-78-C-0018, ARPA Order-2656

Instruments for infrared measurements of natural and man produced infrared sources are described and measurements were planned, performed, and analyzed. The measured or analyzed data included the following: Measurements of aircraft emissions and reflections in fixed spectral bands between 2.5. and 7.5 micrometer; analyses of near infrared auroral and airglow emissions in the 1.7 micrometer and 2.8 micrometer region; and quantitative measurements and analyses of the spatial emissions and backgrounds in the 2 to 15 micrometer region. The measurements were taken with the radiometric instruments described and by spectrometers, and spatial mappers which were operated on AFGL's NKC-135 aircraft. The instruments were periodically inspected, maintained and kept in a state of readiness. Studies and recommendations were made indicating that the reliability of many future measurements could be improved using cryogenically cooled radiometers and interferometer-spectrometers. (Author)

AD-A108 944/0 PC **A03**/MF **A01**
Army Test and Evaluation Command, Aberdeen Proving Ground, MD.
Tropic Tests of Chemical Equipment.
Final rept. on test operations procedure.
15 Dec 81, 27p Rept no. TOP-8-3-512
Supersedes Rept. no. TOP-8-1-002 dated 10 Sep 74.

This Test Operations Procedure (TOP) provides procedures for tropic testing of chemical munitions, weapons, and equipment to determine their ability to withstand the humid tropic environment. It specifies procedures and conditions under which testing, data collection, and data evaluation are to be performed. The TOP is applicable to the basic climatic design type, Quadripartite Standardization Agreement (QSTAG) equivalents B1 and B2, as specified in AR 70-38. The procedures are oriented to tests on chemical offensive weapons, Defensive equipment, protective equipment, and decontaminating equipment. The TOP divides tropic testing into two parts--Test Conduct and Test Data. It also treats each of these parts according to initial inspection, functional performance, short-term storage, surveillance (long-term storage), maintenance evaluation, human factors security from detection, and value analysis. The TOP provides a guide for test planning and should be used in conjunction with other appropriate Test Operation Procedures for specific commodity items undergoing tests. (Author)

AD-A109 348/3 PC **A02**/MF **A01**
Utah State Univ., Logan.
CIRRIS--A Cryogenic Infrared (IR) Radiance Instrument for Shuttle,
M. Ahmadjian, D. R. Smith, A. T. Stair, and K. Baker. 1981, 11p AFGL-TR-81-0360
Contract F19628-79-C-0080
Pub. in Proceedings of SPIE, v280 p45-53 1981.

No abstract available.

DE82900386 PC **A03**/MF **A01**
Canada Centre for Mineral and Energy Technology, Ottawa (Ontario).
Design and Operation of a Motorized Binary Gas Mixture Apparatus.
S. Silver. Feb 80, 28p ERP/MRL-80-32(TR)
U.S. Sales Only.

The main design criteria for a motorized version of a previously designed unit (known as the Binary Gas Mixture Apparatus) are described. Detailed sequential steps are provided to the user for purging clean the chamber and two methods for preparation of predetermined gas-air mixtures. Each method has some advantages over the other but method no. 1 has a maximum accumulative error of 0.004% (for a 20.555% mixture) as compared to 0.002% for method no. 2. For weak mixtures, such as 2.0555% mixtures, this error is reduced to 0.0002%. (ERA citation 07:004912)

N82-14199/5 PC **A03**/MF **A01**
Ruhr-Universitaet Bochum (Germany, F.R.).
Preparatory Tasks on the Definition and Optimization of the out of Ecliptic Zodiacal Light Experiment.
Final Report, Feb. 1980.
R. H. Giese, G. H. Schwehm, and D. Hablick. Feb 81, 43p BMFT-FB-W-81-009, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The experiment consists of a scanning photopolarimeter, developed on the basis of the Helios Zodiacal Light Experiment. The scientific objectives are to study the spatial distribution of the interplanetary dust cloud, to investigate the diffuse brightness of the background star light when the sonde is above the zodiacal light cloud, and to search for a possible contribution of interstellar dust particles to the zodiacal light cloud. The instrument allows simultaneous measurements in two separate wavelength bands (UV and visual channel). Measurements are performed near 200, 220, 240, 280, 350 (UV) and at 360, 440, 540, 640, and 800 nm, including the state of polarization (Stokes parameters I, Q, U). First estimates of expected brightness values at selected viewing directions are presented for typical phases of the mission.

N82-14212/6 PC **A03**/MF **A01**
Texas Univ. at Dallas, Richardson. Center for Space Sciences.
Molecular Wake Shield Gas Analyzer.
Final Report.
J. H. Hoffman. 6 Aug 80, 28p NASA-CR-161926
Contract NAS8-32689
Revised.

Techniques for measuring and characterizing the ultra-high vacuum in the wake of an orbiting spacecraft are studied. A high sensitivity mass spectrometer that contains a double mass analyzer consisting of an open source miniature magnetic sector field neutral gas analyzer and an identical ion analyzer is proposed. These are configured to detect and identify gas and ion species of hydrogen, helium, nitrogen, oxygen, nitric oxide, and carbon dioxide and any other gas or ion species in the 1 to 46 amu mass range. This range covers the normal atmospheric constituents. The sensitivity of the instrument is sufficient to measure ambient gases and ion with a particle density of the order of one per cc. A chemical pump, or getter, is mounted near the entrance aperture of the neutral gas analyzer which integrates the absorption of ambient gases for a selectable period of time for subsequent release and analysis. The sensitivity is realizable for all but rare gases using this technique.

N82-14327/2 PC **A03**/MF **A01**
Prins Maurits Lab. TNO, Rijswijk (Netherlands).
A Microwave Induced Helium Plasma Emission Detector for Gas Chromatography.
A. Verweij. Dec 79, 26p PML-1979-75, TDCK-73058
Contract A74/K/029

The suitability of the detector for analysis of carbon, fluorine, chlorine, phosphorus and sulfur compounds is investigated. The influence of variations in the microwave power, the helium gas flow, the discharge gas pressure and the observation zone of the plasma on the operation of the detector were studied. From an experiment carried out with two model compounds, the detection limit and linear dynamic range of the detector are determined.

N82-14474/2 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Comparison of Thin-Film Resistance Heat-Transfer Gages with Thin-Skin Transient Calorimeter Gages in Conventional Hypersonic Wind Tunnels.
C. G. Miller, III. Dec 81, 93p NASA-TM-83197, L-14627

Thin film gages deposited at the stagnation region of small (8.1-mm-diameter) hemispheres and gages mounted flush with the surface of a sharp-leading-edge flat plate were tested in the Langley continuous-flow hypersonic tunnel and in the Langley hypersonic CF4 tunnel. Two substrate materials were tested, quartz and a machinable glass-ceramic. Small hemispheres were also tested utilizing the thin-skin transient calorimeter technique usually employed in conventional tunnels. One transient calorimeter model was a thin shell of stainless steel, and the other was a thin-skin insert of stainless steel mounted into a hemisphere fabricated from a machinable-glass-ceramic. Measured heat-transfer rates from the various hemispheres were compared with one another and with predicted rates. The results demonstrate the feasibility and advantages of using-film resistance heat-transfer gages in conventional hypersonic wind tunnels over a wide range of conditions.

N82-14494/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
An Experimental Investigation into the Feasibility of a Thermoelectric Heat Flux Gage.
J. C. Jones, and G. J. Vanfossen, Jr. Dec 81, 17p NASA-TM-82755, E-1071

An experiment was conducted to determine the feasibility of using a commerically available thermoelectric device as a heat flux gage. In certain research applications, the thermoelectric heat flux gage can provide a relatively simple means to model a warm fluid--cold wall. The experiment showed that heat flux through the gage could be correlated within two percent to the applied thermoelectric current through the device and the hot and cold side temperature with a simple algebraic equation.

N82-14501/2 PC **A03**/MF **A01**
Rottenkolber Holo-System G.m.b.H., Obing (Germany, F.R.).
Manufacture and Testing of a Prototype Holographic Series Tire Tester.
Final Report.
H. Rottenkolber. Dec 80, 27p BMFT-FB-T-80-192, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The testing unit is for nondestructive tire testing, especially for retreads. The working conditions in the production area and the effects on the unit or its components were determined. The elaborated equipment draft meets production requirements. However, the cost is too high for broad application.

N82-14504/6 PC **A03**/MF **A01**
Zeiss (Carl), Oberkochen (Germany, F.R.).
Pmp 80 Automatic Photometer.
Final Report, Sep. 1979.
G. R. Lampe. Feb 81, 32p BMFT-FB-T-81-051, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Personnel and apparatus cost reduction as well as guaranteeing and improving the quality of the results are emphasized. This photometer permits interlaced measurement of the enzyme kinetics of several samples over a fairly long period of time and at a high sample rate. It also allows determination of substrate concentrations by end point measurements. In enzyme activity determinations, an aliquot volume of serum is added to the appropriate substrate and transferred to a transport chain with plastic cells. The samples are accurately thermostatically controlled in a contact thermostat. After the addition of the inducing reagent the samples are mixed. The sample chain is then fed to a microprocessor-controlled photometer which, after carrying out regression calculations, documents the activities plus errors on an integrated printer.

N82-14505/3 PC **A05**/MF **A01**
Dornier-Werke G.m.b.H., Friedrichshafen (Germany, F.R.).
Analysis and Calculation of Special System Aspects for the Conical Scan Radiometer (Phase A).
Final Report.
H. Klostermann, K. Thoermer, and W. Ruehe. Feb 81, 86p BMFT-FB-W-81-003, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Alternative concepts for a flexible radiometer system for Sun calibration were analyzed, imposing as few constraints as possible to the spacecraft system. The principal possibilities for the variation of the instantaneous field of view (FOV) were investigated in order to provide better data correlation for the wide FOV system. The influence of polarization on the system energy transfer function was calculated. Results make it possible to specify a system with higher performance concerning system calibration and geometrical data correlation. The theoretical limits of radiometric resolution due to polarization errors are given.

N82-14616/8 PC **A03**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Remote Sensing Information Bulletin; Issue Number 6.
Jul 81, 33p

The activities of the Center up to July 1981 are reported. Topics include: the United Kingdom report to the seventh Earthnet meeting, in June 1981; satellite status reports for LANDSAT 1, 2, 3, and D; microwave remote sensing, including Seasat synthetic aperture radar; Mapsat feasibility study; Eros field office; and symposia and conferences organized by the Center, including a summer school on remote sensing applications in marine science and technology.

N82-14914/7 PC **A02**/MF **A01**
Helsinki Univ. of Technology, Otaniemi (Finland).
Studies of Resonance-Light Pressure.
Ph.D. Thesis.
J. Javanainen. 1980, 23p ISBN-951-45-2131-5

A Fokker-Planck equation for the projection of the atomic velocity distribution onto the wave vector direction of a plane wave of light is presented. The formula is also applied to the cooling of gases. The isotope separation by selective deflection of the desired isotope out of an atomic beam is investigated. The laser cooling of an ion trapped in a parabolic potential well, and the three dimensional problem of a trapped ion with an arbitrary direction of the incident laser beam are examined. The center of mass motion of the ion is analyzed in the representation of the harmonic oscillator eigenstates. The rate equations presuppose that either the intensity is low, or that the frequency of the mechanical oscillator exceeds the power broadened linewidth of the transition.

PAT-APPL-6-297 605 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Method for Suppressing Thermally Induced Signals in Fiber Optic Interferometric Sensors.
Patent Application,
Richard G. Priest. Filed 31 Aug 81, 10p AD-D009 066/2
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A method and apparatus is described for providing an improved Mach - Zehnder interferometer type optical fiber acoustic sensor wherein spurious environmentally induced signals are separated from the sensor output and fed back into the system in a manner to cancel their effect. Both true and spurious acoustic signals cause a phase shift in light passing through a sensing arm of a Mach-Zehnder interferometer. Error signals, corresponding to the frequency of the spurious signals, are selected from the interferometer output, processed, and fed back into the interferometer output, processed, and fed back into the interferometer reference arm in a manner to cause a phase shift therein just sufficient to cancel the effect of the initial spurious acoustic signal, whereby the interferometer is locked in phase and held quadrature condition such that the output signal represents the true (desired) signal.

PAT-APPL-6-300 867 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Coarse/Fine Digital Pattern Combiner for High Accuracy Angular Measurements.
Patent Application,
Elzie H. Freeman. Filed 10 Sep 81, 13p AD-D009 067/0
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A rotary shaft position measurement system is described using digital position detectors providing coarse and fine binary word readouts having four overlapping bits all of which are having subtractively compared to provide command signals that are used to correct the non-overlapping portion of the coarse word prior to combining with the fine word. The comparator utilizes a binary four bit full adder in combination with coarse word input inversion, and direct and inverted application of the carryout and sigma 4 outputs to first and second AND gates to generate coarse word correction commands.

PAT-APPL-6-306 111 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Pit Depth Gauge.
Patent Application,
John Mittleman. Filed 28 Sep 81, 10p AD-D009 068/8
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention relates to the field of ultrasonic inspection, and more particularly to apparatus for carrying out such inspection of the underwater portions of a ship hull or other underwater structure for pitting due to corrosion or the like. Measuring of corrosion pits is not commonly done underwater because there has been no convenient means for doing so. Rather, a diver usually merely estimates the pit depths visually. More precise measurements can be taken using feeler gauges or by replicating the corroded surface with wax or epoxy compounds. These techniques, however, are time consuming and do not provide a read-out above water except by having the diver carry notes or replicas topside. Considerable advances have been made in assessment of the condition of thickness of underwater hull plates by a diver hand carried ultrasonic transducer probe that is moved along the underwater surface of a hull plate. The return or reflected signals

are recorded topside and provide much meaningful data as to hull condition, most notably hull plate thickness. Pitting of the plates, however, is not readily or accurately determined from such data, because the shapes and sizes of pits are such as to provide irregular sonic returns that are difficult, if not impossible, to interpret with confidence as to pit existance and dimensions. (Author)

PATENT-4 300 159 Not available NTIS
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Scanner.
Patent,
R. F. Hummer, and D. T. Upton. Filed 19 May 75, patented 10 Nov 81, 12p N82-13465/1, PAT-APPL-578 700
Supersedes PAT-APPL-578 700-75, N76-19408 (14 - 10, p 1252).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

An aerial vehicle rotating in gyroscopic fashion about one of its axes has an optical system which scans an area below the vehicle in determined relation to vehicle rotation. A sensing device is provided to sense the physical condition of the area of scan and optical means are associated to direct the physical intelligence received from the scan area to the sensing means. Means are provided to incrementally move the optical means through a series of steps to effect sequential line scan of the area being viewed keyed to the rotational rate of the vehicle.

PB82-149840 Not available NTIS
National Bureau of Standards, Washington, DC.
Dual-Electrode, Liquid Chromatographic Detector for the Determination of Analytes with High Redox Potentials.
Final rept.,
William A. MacCrehan, and Richard A. Durst. 1981, 5p
Pub. in Analytical Chemistry 53, p1700-1704 1981.

An electrochemical detection approach for liquid chromatography is described utilizing two sequential, generator/detector electrodes. Analytes are first electrolyzed, and the reaction products are then detected electrochemically at a second electrode. In some cases, this allows the detection of analytes with high redox potentials, with good sensitivity and selectivity. The technique is tested on several organic analytes: dichlone, nitrobenzene, and three organotin cations.

PB82-149899 Not available NTIS
National Bureau of Standards, Washington, DC.
A Real-Time Vibration Controller,
M. R. Serbyn, and W. B. Penzes. 1981, 5p
Pub. in Proceedings of International Instrumentation Symposium (27th), Indianapolis, Indiana, April 1981, Paper in Instrumentation in the Aerospace Industry 27, p489-494 1981.

The Michelson interferometer is viewed as a noisy system whose noise input consists of unwanted changes in its optical path length, and whose desired output is a constant optical path-length difference. A technique for maintaining this quantity at a value equal to a multiple of quarter wavelengths of the light it described. This is accomplished by periodically comparing the phase difference between the fundamental and the second-harmonic components of the photodetector output. Using this information, a logic unit causes positive or negative-going ramp signals to be generated and applied to the 'fixed' mirror as a path-length correction.

PB82-149907 Not available NTIS
National Bureau of Standards, Washington, DC.
NBS Prototype Line-Heat Source Guarded-Hot-Plate Apparatus,
M. C. I. Siu, and C. Bulik. Nov 81, 8p
Pub. in Review of Scientific Instruments 52, n11 p1709-1716 Nov 81.

A description is given of a line-heat-source guarded-hot-plate apparatus for determining the effective thermal conductivity of insulation materials in the temperature range from 250 K to 400 K. Measurements made on fibrous glass boards are in good agreement with results obtained from the guarded-hot-plate apparatus in operation at the National Bureau of Standards for over 40 years.

PB82-150996 PC **A02**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
A Simplified Frequency Deviation Transducer,
Eugene Campbell, and James R. Schurz. Nov 81, 15p REC-ERC-81-13

A frequency deviation transducer with fast response has been developed using period comparison in CMOS and analog logic. The transducer is useful in monitoring frequency where frequency deviation is important and long-term accuracy is not required.

PB82-152117 Not available NTIS
National Bureau of Standards, Washington, DC.
Modelling the Impedance of a Josephson-Junction Noise Thermometer,
Robert L. Peterson, and Deborah Van Vechten. Sep 81, 4p
Pub. in Physical Review B 24, n6 p3588-3591, 15 Sep 81.

Recent experiments on noise thermometers made with Josephson junctions (rf SQUID's (superconducting quantum interference devices) shunted by a small resistance R) have shown that the SQUID impedance has an envelope which generally rises to the value of R as the rf power is increased, although the envelope can be distorted when the frequency is just above the rf circuit resonance. The authors summarize the results of a mathematical analysis which shows that in the absence of noise, and with no reactive feedback of the SQUID upon the rf circuit, the SQUID impedance will have a uniformly rising envelope because of the SQUID inductance. The calculated curves have the characteristics of the experimental observations in the rising-envelope cases.

PB82-152414 Not available NTIS
National Bureau of Standards, Washington, DC.
Theory of Acoustic Emission,
John A. Simmons, and Roger B. Clough. 1981, 34p
Pub. in Proceedings of International Conference on Dislocation Modelling of Physical Systems, Gainesville, Florida, June 1980, p464-497 1981.

A theory of acoustic emission is presented based on a Green's function type of formalism, rather than on the conventional count rate concept. Sources are represented by stress drop rate tensors and conditions are derived from which the source can be considered small in terms of wavelength and distance to the transducer. These 'pseudopoint' sources are examined over a restricted frequency bandwidth, called the 'informative bandwidth.' Such a bandlimited system may be described by a tensor transfer function type of formalism, facilitating the analysis and reducing the inverse problem--where the source is not known a priori--to a deconvolution operation.

PB82-152497 Not available NTIS
National Bureau of Standards, Washington, DC.
Gage Installation Can Trim Level-Measurement.
Final rept.,
J. D. Siegwarth. Dec 81, 5p
Pub. in Oil Gas Jnl. 79, n49 p142-144, 149, 152, Dec 81.

The systematic errors introduced into level measurements by the gage-mounting method and the tank environment are analyzed for the cable-type gage with emphasis on LNG level gaging. The cable-type gage consists of a movable surface sensor suspended by a cable, tape, or wire. Two gage-installation methods that eliminate most of the systematic errors are described. Though this study deals primarily with LNG gaging, it applies as well to the gaging of any liquid.

PB82-152547 Not available NTIS
National Bureau of Standards, Washington, DC.
An Overview: New Ideas in Nondestructive Evaluation.
Final rept.,
Harold Berger. 1981, 7p
Pub. in Proceedings Meeting Rubber Division American Chemical Society, Minneapolis, MN., June 2-5 1981, Rubber Chem. Technol. 54, n5 p996-1002 Nov/Dec 81.

Nondestructive evaluation (NDE) normally brings to mind six major methods in use in industrial quality control, visual/optical, x-ray, ultrasonic, penetrant, magnetic and eddy current techniques. While it is true that most NDE involves these basic methods, it is also true that major changes are taking place in terms of modifications of these standard methods and in terms of new inspection approaches. The discussion includes descriptions of modifications such as ultrasonic imaging, x-ray tomography, pulsed eddy current techniques and signal processing. In addition, novel NDE approaches that appear to offer advantages of tire inspection are discussed; these include acoustic emission, pulsed eddy currents, microwaves and vibrothermography.

PB82-152562 Not available NTIS
National Bureau of Standards, Washington, DC.
Absorbed Current Electron Spin Polarization Detector,
D. T Pierce, S. M. Girvin, J. Unguris, and R. J. Celotta. Oct 81, 8p
Sponsored in part by Office of Naval Research, Arlington, VA.
Pub. in Review of Scientific Instruments 52, n10 p1437-1444 Oct 81.

The principle of spin analysis by means of measurement of the spin dependent absorption of a polarized electron beam is presented. The spin dependent signal is enhanced relative to the spin average signal at an energy near which the secondary yield is unity. Both the collected charge method and the zero-crossing method are described for situations where the polarization can and cannot be reversed. A statistical analysis of the uncertainty in the polarization determination by each method is given. Annealed, evaporated Au films are shown to be suitable for the detecting surface of this spin detector. The figure of merit is derived and found for Au films to be comparable to the very best Mott detectors, but the electron optical acceptance is smaller. The applications for which this simple compact spin detector are especially suited are discussed.

PB82-152661 Not available NTIS
National Bureau of Standards, Washington, DC.
Reproducible Acoustic Emission Signatures by Indentation in Steels,
Roger B. Clough, and John A. Simmons. Oct 81, 6p
Sponsored in part by Electric Power Research Inst., Palo Alto, CA.
Pub. in Materials Evaluation 39, p1026-1031 Oct 81.

Creating reproducible signals from defects is of great importance for quantitative studies of acoustic emission (AE). A method for doing so is presented here which consists of indentation of hardened steel plates.

PB82-152760 Not available NTIS
National Bureau of Standards, Washington, DC.
Sizing of Individual Optically Levitated Evaporating Droplets by Measurement of Resonances in the Polarization Ratio,
T. R. Lettieri, W. D. Jenkins, and D. A. Swyt. Aug 81, 7p
Pub. in Applied Optics 20, p2799-2805, 15 Aug 81.

Resonances observed in the polarization ratio of light scattered at 90 degrees from single optically levitated evaporating droplets are shown to provide a means for continuous, high-resolution monitoring of droplet size. Due to the distinctive character of the individual features in the polarization ratio, each experimentally measured feature could be clearly identified with a specific calculated one. For evaporating droplets of glycerol from 6.6 to 11.5 micrometers in diameter, the sharp features which appeared in the calculations at approximately 0.03 micrometer intervals allowed measurement of droplet diameter to a resolution of 0.003 micrometers.

PB82-153271 Not available NTIS
National Bureau of Standards, Washington, DC.
A High-Resolution X-Ray Facility,
Haydn Chen, and Masao Kuriyama. 1981, 1p
Pub. in Jnl. of Applied Cryst. Lab. Note 14, p280 1981.

An x-ray diffraction system capable of producing and detecting x-rays with an angular resolution better than two seconds of arc has been developed.

PB82-155045 Not available NTIS
National Bureau of Standards, Washington, DC.
Fundamental Developments for Quantitative Acoustic Emission Measurements.
Final rept.,
D. G. Eitzen, F. R. Breckenridge, R. B. Clough, E. R. Fuller, and J. A. Simmons. Jun 81, 213p

Pub. in Electric Power Research Inst. Interim Report No. EPRI-NP-2089, Project 608-1, 213 p Jun 81.

The work under Phase I of the program has focused on: improved test standardization through the development of a calibration capability for AE sensors; improved sensor concepts and techniques for field and laboratory calibration; an improved basis for understanding and predicting AE behavior through the development of a methematical framework for AE (transfer function formalism) through specific theoretical solutions to AE generation, transmission and inversion problems and the successful application of these theories to actual events in glass; an improved basis for assessing defect significance through the development of improved signal processing and inversion methods and through experimental results from AE in pressure vessel steels; the implementation of experiments to establish the feasibility of using casual methods, based on theoretical mechanics, to obtain source information in structural steels.

PB82-155276 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
High-Resolution Solenoid Coil Nuclear Magnetic Resonance Probe for Superconducting Magnet Spectrometers.
Journal article,
J. Terry Bailey, Richard C. Rosanske, and George C. Levy. 6 Dec 80, 7p EPA-600/J-81-516
Grant EPA-R-804916
Pub. in Review of Scientific Instrumentation, v54 n4 p548-552 Apr 81.

A broadband probe having a tuning range of 20 to 65 MHz has been designed and built specifically to give maximum sensitivity per unit volume of sample. This is accomplished through use of a solenoid rf coil instead of the usual Helmholtz coil found in commercial probes for superconducting magnet systems. Improvement in signal-to-noise ratios approaches a factor of 3. Probe design considerations and construction materials are described.

PB82-158189 PC **A02**/MF **A01**
North Carolina State Univ. at Raleigh.
Photoacoustic Observation of Thermal Wave Interference Effects in Thin Samples.
Journal article,
C. A. Bennett, Jr., and R. R. Patty. Mar 81, 4p EPA-600/J-81-132
Grant EPA-R-805332
Pub. in Applied Optics, v20 n6 p60-61, 15 Mar 81.

The photoacoustic response arising from very thin and highly adsorbing layers contains structure resulting from thermal wave interference effects within the samples. The nature of these effects is dependent upon the chopping frequency and upon the thermal properties of the backing material. This structure provides information that may prove to be useful in analyzing the thickness or thermal properties of such layers. As applied to detection of soot collected from this ambient air, the thermal wave interference phenomenon is one factor in relating photoacoustic response versus soot loading on a filter.

PB82-804006 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ion Selective Electrodes. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 241p
Supersedes PB80-815418, and NTIS/PS-79/1026.

Federally-funded research on the use of ion selective electrodes for chemical analysis is cited. Design, analytical methods, and applications are covered. (This updated bibliography contains 234 citations, 34 of which are new entries to the previous edition.)

PB82-861972 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Wind Tunnels. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 295p
Supersedes PB81-859472.Prepared in cooperation with the Department of Energy, Washington, DC.

Articles cited in this bibliography discuss the design and applications of wind tunnels. The use of wind tunnels for the testing and modelling of such things as aircraft, buildings mobile homes, aircraft engines, windmills, and air pollution dispersal is discussed. Topics include trends in vehicle aerocynamic improvements and their effect of performance and fuel economy, wind load study on solar collector arrays, and wind tunnel modelling of plume dispersion. (This updated bibliography contains 290 citations, 90 of which are new entries to the previous edition.)

14D. Reliability

AD-A108 803/8 PC **A10**/MF **A01**
Grumman Aerospace Corp., Bethpage, NY.
Taped Random Spectra for Reliability Demonstration Testing.
Final rept. Oct 79-Apr 81,
Joseph J. Popolo, John G. Devitt, Richard Pokallus, and Noe Arcas. Apr 81, 211p Rept no. RMS-81-R-1
Contract N00019-77-C-0032

This study was undertaken to develop an economical test technique for Reliability Demonstration tests in accordance with MIL-STD-781C. This has been accomplished by developing two different methods: Multiplex System - incorporates a reel-to-reel tape recorder that generates the desired synthesized random spectrum on one channel while the other channel incorporates a control programmer; and Microprocessor System - incorporates a desk top computer that is programmed to initiate, monitor and control a Reliability Demonstration test. Included with this system is a 'sound-on-sound' tape cassette recorder to generate the synthesized random spectrum and a printer to record the control signals and monitor data during the test. (Author)

NUREG/CR-2373 PC **A05**/MF **A01**
Kansas State Univ., Manhattan. Dept. of Nuclear Engineering.
GAMMA: A Code for the Analysis of Component Failure Rates with a Compound Poisson-Gamma Model.
Final technical rept.,
J. K. Shultis, D. E. Johnson, G. A. Milliken, and N. D. Eckhoff. Dec 81, 83p KSU-2075A

The theory is summarized for the homogeneous Poisson and the compound gamma-Poisson probability models which can be used to analyze failure rate attribute data consisting of the number of failures in specified test times for normally operating components or systems. A computer code based on this theory is described, and instructions for its use together with a sample problem and a complete code listing are presented. For the compound model, used in a Bayesian analysis of failure rate data, values of the parameters for the prior gamma distribution are estimated from observed failure data by three methods: (1) matching the data moments to those of the prior distribution, (2) matching the data moments to those of the marginal distribution, and (3) the marginal maximum likelihood method. Many program options are available including variance estimates for the prior parameter estimators, posterior analyses for each component, various statistical comparisons between the homogeneous and compound models, and generalized chi-square and Kolmogorov-Smirnov goodness-of-fit tests for determining how well the failure models describe the observed data.

14E. Reprography

AD-A109 083/6 PC **A02**/MF **A01**
Texas Tech Univ., Lubbock. Dept. of Electrical Engineering.
Space-Variant Optical Systems.
Annual rept. 30 Sep 80-30 Sep 81,
John F. Walkup, and Thomas F. Krile. Nov 81, 15p AFOSR-TR-81-0834
Grant AFOSR-79-0076

Analytical and experimental investigations of 2-D space-variant optical processing techniques have been conducted. Coherent processing investigations have included (1) an experimental study of the characteristics of photoresist phase masks for multiplex holography, (2) the development of facility for generating high quality computer-generated holograms by use of a laser plotter, and (3) analytical investigation of an idea for using 1-D techniques to perform 2-D space variant operations. In the incoherent processing area we have proceeded with experiments to test the tristimulus-based technique for performing complex operations using hue, saturation, and intensity parameters to represent complex numbers. (Author)

AD-A109 085/1 PC **A03**/MF **A01**
Behrend Coll., Erie, PA. Div. of Natural Sciences and Engineering.
Pulsed Holography of Rapidly Moving Dust Particles.
Final research rept. 1 Jun 80-30 Mar 81,
Keith M. Hagenbush. 31 May 81, 30p AFOSR-TR-81-0847
Grant AFOSR-80-0197
Prepared in cooperation with Pennsylvania State Univ., Materials Research Lab. and Firestone Tire and Rubber Co.

Alumina particles ranging from minor dimension 25 microns to major dimension 185 microns are given 20-120 m/s velocities via a carrier gas through a 500 microns nozzle. Off-axis image plane holograms are constructed of the dust. Resolution to 6 to 10 microns is achieved and image subtraction via a Pockel's cell external to the laser cavity is employed to restore contrast loss in double exposures. Particle velocities are measured in double exposures. (Author)

N82-14503/8 PC **A05**/MF **A01**
Spindler und Hover G.m.b.H. und Co., Goettingen (Germany, F.R.).
Development of a Linear Measuring System.
Final Report.
D. Mallwitz, and R. Lessing. Feb 81, 97p BMFT-FB-T-81-031, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Tests show that photographic coatings marked with corresponding graduations are usable for linear measuring systems. Processing of holographically produced gratings on adequate photo plates, the structures of which are appropriate for a linear measuring system is described. Gratings of this kind can be copied in a simple way under certain conditions. Two operational models are discussed which can be used in the range of the optical length measuring technique with digital indication of measured values.

15.

MILITARY SCIENCES

15C. Defense

AD-A109 079/4 PC **A07**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Ventilation Surge Techniques. Volume I.
Final rept. Sep 80-Dec 81,
M. D. Wright, W. Berryhill, and R. Wallace. Dec 81, 150p Rept no. RTI/2084/00-04F-VOL-1
Contract EMW-C-0353

The objectives of this project were to investigate the effects of partitions, dense occupancy, and expedient openings on the airflow pattern in fallout shelters. Both experimental and theoretical techniques were used in the study. The experimental program examined airflow patterns for both mechanically driven and thermally driven ventilation. Mechanical ventilation was supplied by an axial fan driven by an electric motor. The thermal ventilation was supplied by simulating the metabolic heat load of the shelter occupants. Because metabolic heat is a combination of sensible and latent heat, a theoretical analysis was made of the relative effect of each type of heat on buoyance. The result showed that latent heat has a much smaller buoyancy effect

and, consequently, only the sensible heat input was simulated during the experiments using thermally driven ventilation. Ventilation tests were made using 25 shelter configurations. Airflow patterns and temperature distributions were measured in each configuration using both natural and forced ventilation. An evaluation of the applicability of expedient openings was made using data from the literature and personal contacts. The evaluation addressed a wide variety of construction types and cutting techniques. (Author)

AD-A109 342/6 PC **A03**/MF **A01**
Joint Chiefs of Staff, Washington, DC.
Soviet News and Propaganda Analysis from 'RED STAR' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 October 1981. Volume 1, Number 10.
1981, 46p
See also Volume 1, AD-A108 028.

The data in this report reflects Soviet print media emphasis and propaganda trends for over two years -- July 1979 to October 1981. During this period, more than 30,000 feature stories and news items were analyzed. The main purpose of this paper is to provide the reader with an overview of Soviet rhetoric and propaganda themes directed to Russian military forces during October 1981. This report contains a summary of the propaganda themes from the Russian language newspaper Red Star. Soviet perceptions of international events and Soviet domestic and military subjects are examined. During October, the amount of space allocated to the 'arms race' increased. Soviet propagandists repeatedly used the term 'new super-military program' to describe increases in U.S. military forces and production and development of weapons. Soviet coverage of events in Poland increased in October. Moscow's rhetoric was dogmatic and unequivocal in regard to the anti-socialist nature of Solidarity. The assassination of President Sadat of Egypt received modest coverage in the Soviet military press.

15E. Logistics

AD-A108 839/2 PC **A04**/MF **A01**
Logistics Studies Office (ALMC), Fort Lee, VA.
Expedited Return of Major Item Excess.
Final rept.,
Peter J. Higgins. Sep 81, 67p Rept no. LSO-014

Certain major items require that technical inspection documentation accompany Reports of Excess. Since these inspection reports have not been automated for transmission through AUTODIN, they must be mailed with the corresponding Report of Excess. This necessitates time consuming off-line processing at the Materiel Readiness Command (MRC) and circumvents receipt by the Logistics Control Activity. Two major recommendations are made in this study. The first describes a method to transfer inspection data by automated means and the second a change in procedures at one MRC. Benefits of the two recommendations are based upon a selected sample of Line Item Numbers. (Author)

AD-A109 135/4 PC **A19**/MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume II. Materiel Postprocessor Program Maintenance Manual.
Final rept. Sep 80-Aug 81,
Scott Cantlon, and Ronald G. Rhoades. Aug 81, 450p CAA-D-81-2-VOL-2
Contract MDA903-80-D-0668
See also Volume 1, AD-A107 076.

This manual provides information on the programs, processing and maintenance of the 19 computer software programs that comprise the Materiel Postprocessor (MPP) of the Wartime Requirements for Ammunition, Materiel and Personnel (WARRAMP) methodology. This manual provides a general overview of the methodology system followed by a programmer level discussion of each program. The discussion includes details on the description of processing, the operating environment and program maintenance procedures. Sample runstreams and program source code listing are included in this manual for the applications on the UNIVAC 1100/82 installed at the US Army Concepts Analysis Agency. (Author)

AD-A109 308/7 PC **A02**/MF **A01**
Air Force Logistics Command, Wright-Patterson AFB, OH.
Visibility and Management of Operating and Support Costs, System II (VAMOSC II),
Thomas J. Recktenwalt. Mar 81, 16p
Presented at the Department of Defense Annual Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

The Department of Defense has long recognized that the total cost of fielding new weapon systems is not nearly expressed in initial design, development, and acquisition costs. Inquiry has shown that Operating and Support (O&S) costs exceed the initial acquisition costs and thus, must be considered in the decision matrix when new or modified weapon systems are proposed. There has been, however, no clear visibility of O&S costs available for use in the decision process. The military services were directed to develop a system to present Visibility and Management of Operating and Support Costs (VAMOSC). This direction was provided in a Management by Objective (MBO) Initiative 9-2 and contained three parts; O&S costs by weapon system, to portray costs by major subassembly or components, and to portray these costs in standard accounting elements across all weapon systems. The Air Force System will be comprised of three parts: (1) a weapon system portrayal for aircraft at the MDS level called, Weapons Systems Support Cost; (2) a second element which addresses O&S costs for Communications-Electronic (C-E) equipment at the TMS level; and (3) a component of the VAMOSC system that will report O&S costs for subassemblies of MDS or TMS systems. The Air Force VAMOSC II effort is scheduled for full implementation in mid-1982.

AD-A109 380/6 PC **A03**/MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA.
Long Range Plan for Embedded Computer Systems Support. Volume I. Executive Overview.
Final rept. Dec 80-Aug 81.
Oct 81, 26p Rept no. TRW-34330-6004-UT-00
Contract F33600-79-C-0540
See also Volume 2, AD-A109 381.

The life cycle support of the ever increasing number of computer systems embedded in weapon systems is a major challenge to the Air Force. With continued operational and support emphasis on performance and responsiveness to a dynamic mission environment, significant enhancement of support capabilities for all categories of embedded computer systems, (ECS) is required. This report contains recommendations for acquiring such capabilities. Concurrent implementation of the administrative initiatives combined with the four programmatic initiatives is recommended to address ECS life cycle support. Early implementation of the administrative initiatives is needed not only to correct deficiencies in the acquisition and operation of ECS support systems in the near term, but to establish a clear framework of policy and guidance for AFLC interactions and coordination with the development and user commands; early implementation is also required to enable the subsequent actions necessary for enhancing existing capabilities and acquiring new capabilities to improve the ECS support process through implementation of the programmatic initiatives. The recommendations for each initiative related to the ECS support process, with anticipated benefits, estimated resources, and the development period required for improving the overall future ECS support posture, are summarized.

AD-A109 381/4 PC **A15**/MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA.
Long Range Plan for Embedded Computer Systems Support. Volume II.
Final rept. Dec 80-Aug 81.
Oct 81, 343p Rept no. TRW-34330-6005-UT-00
Contract F33600-79-C-0540
See also Volume 1, AD-A109 380.

The life cycle support of the ever increasing number of computer systems embedded in weapon systems is a major challenge to the Air Force. With continued operational and support emphasis on performance and responsiveness to a dynamic mission environment, significant enhancement of support capabilities for all categories of embedded computer systems is required. This report contains recommendations for acquiring such capabilities. (Author)

AD-A109 414/3 PC **A04**/MF **A01**
Management Consulting and Research, Inc., Falls Church, VA.
Analysis of DoD Weapon System Cost Growth Using Selected Acquisition Reports (as of 31 December 1980),
Gerald R. McNichols, and Bruce J. McKinney. 7 Oct 81, 61p
Contract MDA903-81-M-3057
Presented at the Annual Department of Defense Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

A typical weapon system program undergoes cost growth related to program milestones. A Planning Estimate (PE) is developed at the time the Secretary of Defense approves program initiation. Milestone I (Advanced Development) is considered as program initiation for Selected Acquisition Report (SAR) purposes. A Development Estimate (DE) is made at the time full-scale engineering development is initiated, called Milestone II. The DE serves as the baseline to which all program changes are then compared. The majority of the program cost growth is observed typically in the time period after Milestone II and prior to Milestone III, approval for production. Program cost growth typically continues in the production phase, although at a much lower rate. Because of the 'Maturing' of programs over time, it is beneficial to separate cost growth into two categories corresponding to systems in (1) Development, or (2) Procurement.

PB82-160045 PC**$10.00**/MF **A01**
Department of Defense, Washington, DC.
Program Acquisition Costs by Weapon System, Department of Defense Budget for Fiscal Year 1983.
8 Feb 82, 183p

This document presents a catalogue of Department of Defense Program Acquisition Costs from Fiscal Year 1981 through Fiscal Year 1983. Also included are system nomenclature, description, mission and budget for each program. Each system is further broken down by Procurement; R,D,T&E; and Military Construction costs.

PB82-160052 PC**$15.00**/MF **A01**
Department of Defense, Washington, DC.
Construction Programs (C-1), Department of Defense Budget for Fiscal Year 1983.
8 Feb 82, 322p

This document provides details of the request for the FY 1983 Construction Program of the Department of Defense. It is derived from and is consistent with the DoD Five Year Defense Program Construction Annex data base.

PB82-160078 PC**$9.00**/MF **A01**
Department of Defense, Washington, DC.
Procurement Programs (P-1), Department of Defense Budget for Fiscal Year 1983.
8 Feb 82, 140p

This document provides details of the request for the FY 1983 Procurement Program of the Department of Defense Budget. It is derived from and is consistent with the DoD Five Year Defense Procurement Annex data base.

PB82-862269 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waterway Transportation. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 182p
Supersedes PB81-858896.

This bibliography contains citations on the development and progress of waterway transportation systems applicable to ocean, river, lake, and canal travel. High-speed mass transit commuter service, economics of agricultural product transportation, major ports and cargo facilities located on major rivers and tributaries, and environmental impacts of optimal waterborne travel are among the topics discussed relevant to the utilization of navigable waterways. The design, construction, and maintenance of ports, and the regulation and control of waterway traffic are also included. (This updated bibliography contains 156 citations, 12 of which are new entries to the previous edition.)

PB82-862418 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waterway Transportation. 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Feb 82.
Feb 82, 247p
Supersedes PB81-858904.

Reports are cited which discuss the development of transportation systems for ocean, river, lake, and canal travel. Microprocessor technology in waterway vessel traffic systems, existing port site modernization projects, energy conservation impacts of modified river freight transport systems, and risk analysis for waterway transportation are among the subjects discussed. Technological innovations in mass transit waterway travel for commuter services are also included. (This updated bibliography contains 272 citations, 72 of which are new entries to the previous edition.)

15F. Nuclear Warfare

INIS-mf-6249 PC **A02**/MF **A01**
UKAEA Headquarters, London (England).
Atomic Energy Authority (Weapons Group) Act 1973.
6 Mar 73, 9p
U.S. Sales Only.

This Act, which came into force on 6th March 1973 and modified Section 2 of the Atomic Energy Authority Act 1954 in respect of the Authority's power to do work on explosive nuclear devices, made provision for the transfer to the Secretary of State for Defence of the Weapons Group of the Atomic Energy Authority. (Atomindex citation 12:578460)

15G. Operations, Strategy, and Tactics

AD-A108 990/3 PC **A02**/MF **A01**
Army War Coll. Strategic Studies Inst., Carlisle Barracks, PA.
The Character of Modern War: Theory-Doctrine-Practice at the Operational Level.
Occasional paper,
Wallace P. Franz. 15 Dec 81, 14p

This paper deals with the character of modern war at the operational level and how military theory can assist the US Army in the 1980's. The paper covers the process of converting theory to practice in order to enhance the capability to employ military force in support of national policy. A proper military doctrine developed from the study of military theory can provide more assistance in heightening national security than any number of weapons systems, because a realistic theory takes both material and nonmaterial factors into consideration. (Author)

AD-A109 124/8 PC **A13**/MF **A01**
Army Materiel Systems Analysis Activity, Aberdeen Proving Ground, MD.
Proceedings of the Meeting of the Coordinating Group on Modern Control Theory (3rd) (20-21 October 1981) US Army Missile Command, Redstone Arsenal, AL. Part I,
Herbert E. Cohen. Nov 81, 297p

Contents: Analysis of Tank Fire Control Systems by Optimal Control Theory; General Structure Discrete-Time Observers; On the Design of Predictors for Fire Control Systems; Microprocessor Implementation of an Adaptive Second Order Tracking/Prediction Algorithm for Tank Fire Control; On the Credibility of Models; A Linear Nonlinear Control Problem; Application of Modern Estimation and Control Techniques to the Glaads Test Vehicle; On Designing Robust Predictors Using Finite State Markov Chains; Robust Kalman Filtering; A Case Study of Modern Direct Digital Autopilot Design; Robust Missile Guidance; A New Class of Guidance Laws for Air-to-Air Missiles; Estimating Time-to-Go for use in Advanced Guidance Laws; Microprocessor-Based Optimal Controllers for a Helicopter Turret Control System; Discrete-Time Disturbance-Accommodating Control Theory: The Disturbance-Utilization Mode; Discrete Controller Design for Gaussian and Waveform Type Disturbances; and Stability Control of Large Inertia, Dynamical, Nonlinear Systems in the Presence of Unstabilizing Disturbances.

AD-A109 257/6 PC **E15**/MF **E15**
Army Materiel Development and Readiness Command, Alexandria, VA.
Safety.
Safety manual.
17 Aug 81, 525p Rept no. DARCOM-R-385-100
Supersedes Rept. no. AMC-385-100, dated 21 Apr 70.

This regulation applies to Headquarters, DARCOM; DARCOM major subordinate commands (including subordinate installations and activities); DARCOM project/product managers; and separate installations and activities reporting directly to Headquarters, DARCOM. It prescribes safe methods and practices for safeguarding personnel, insuring continuity of production and preventing property damage. Occupational safety and health standards promulgated under the Occupational Safety and Health Act (OSHA) are minimum requirements of DARCOM. DARCOM-R 385-100 adapts OSHA standards to DARCOM operations/activities, implements DOD ammunition and explosives standards, and prescribes additional safety standards for situations unique to DARCOM. Where OSHA standards conflict with DOD ammunition and explosives standards, the DOD standards will apply. In cases where there is a conflict between OSHA and DARCOM standards, the more restrictive standard will apply and will be specifically, incorporated as a requirement in construction and maintenance contracts and purchase requests. Codes and safety standards of the National Safety Council, American National Standard Institute, National Fire Protection Association and other nationally recognized organizations, not already mandated for implementation by this or other applicable regulations, may be used in conjunction with these regulations to develop appropriate local standards for safe practices and procedures, personal protective equipment, machine guards, etc. However, when these codes or standards are in conflict with OSHA standards or DARCOM regulations, the OSHA standards or DARCOM regulations whichever is more restrictive, shall apply.

AD-A109 374/9 PC **A04**/MF **A01**
Army Combined Arms Combat Developments Activity, Fort Leavenworth, KS.
Cost/Cost Effectiveness Analysis,
Gerald Martin. 7 Oct 81, 73p
Presented at the Annual Department of Defense Cost Analysis Symposium (16th), Arlington, VA, 4-7 Oct 81.

This report provides cost and cost effectiveness analyses for the two heavy division alternatives examined in the Division 86 (Div 86) study. Twenty-year force costs for both divisions are displayed and compared in the cost analysis. The cost effectiveness analysis develops relative effectiveness measures from war gaming results to be compared with relative costs. All results are based on force modernization to the 1986 timeframe.

16.

MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-A108 894/7 PC **A11**/MF **A01**
Range Commanders Council, White Sands Missile Range, NM. Documentation Group.
A Glossary of Range Terminology.
Final rept.
1981, 241p Rept no. DG-502-81
Supersedes AD-756 967.

This glossary contains definitions, acronyms, occasional abbreviations and other information used in daily operations at the major test ranges and facilities. Some of the terminology is peculiar to certain activities, while other terms are common in usage and application. The basic issue of this glossary was a compilation of information from the other groups of the Range Commanders Council (RCC). This revision incorporates additional contributions, suggestions and recommendations submitted by these sources since publication of the basic issue. Major terms and subdivisions are listed alphabetically. Cross-references are used for clarification when necessary.

AD-A109 005/9 PC **A09**/MF **A01**
Range Commanders Council, White Sands Missile Range, NM. Tele-Communications Group.
Instrumentation Timing Systems.
Final rept.
Nov 81, 187p Rept no. TCG-123-81
Supersedes rept. no. TCG-123-72, AD-782 687.

This document is an update of Document 123-72, published April 1972. It describes the timing systems and facilities available at the various Range Commanders Council member and associate member ranges.

16C. Missile Warheads and Fuses

AD-A108 845/9 PC **A08**/MF **A01**
Science Applications, Inc., Wayne, PA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume III. Inviscid Aerodynamic Predictions for Ballistic Reentry Vehicles with Ablated Nosetips.
Final rept. Mar 78-Sep 79,
Darryl W. Hall. Sep 79, 170p SAI-79-506-VF-VOL-3, BMO-TR-81-1-VOL-3
Contract F04701-77-C-0126
See also Volume 3, Appendix, AD-A108 846.

A three-dimensional inviscid time-dependent blunt body flow field code is developed for calculation of hypersonic flow over ablated reentry vehicle nosetips. The code is formulated in a coordinate system that is based on a sequence of conformal mappings and is capable of being aligned with arbitrary nosetip shapes. This procedure includes a finite difference scheme that permits the automatic calculation of embedded shocks in an approximate manner. (Author)

AD-A108 846/7 PC **A06**/MF **A01**
Science Applications, Inc., Wayne, PA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume III. Appendix. Inviscid Aerodynamic Predictions for Ballistic Reentry Vehicles with Ablated Nosetips. Users Manual.
Final rept. Mar 78-Sep 79,
Darryl W. Hall, and Catherine M. Dougherty. Sep 79, 117p SAI-79-506-VF-VOL-3-AP, BMO-TR-81-80-VOL-3-APP
Contract F04701-77-C-0126
See also Volume 5, AD-A108 847.

This report documents the use of the CM3DT inviscid blunt body flow field code. Details are provided on the organization of the code and the inputs required for its operation. Code inputs and outputs are explained for several sample cases, and glossaries of input variables, output variables, and subroutines are provided. The coupling of the CM3DT to a steady supersonic afterbody code is described. (Author)

AD-A108 847/5 PC **A04**/MF **A01**
Science Applications, Inc., Wayne, PA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume V. Infrared Mapping of Boundary Layer Transition on a Slender Cone.
Final rept. Mar 78-Dec 79,
A. Martellucci, and Francis J. Makowski. Apr 80, 70p SAI-067-81R-010-VOL-5, BMO-TR-81-2-VOL-5
Contract F04701-77-C-0126
See also Volume 9, AD-A108 848.

Surface heating was measured and boundary layer transition locations were deduced on a 7 deg half-angle cone model with a base diameter of 12.3 in. The tests were performed at Mach 8 in Tunnel B of the von-Karman Test Facility at Arnold Engineering Development Center. The objective of the current effort was to experimentally define transition onset, zone extent and shape for configurations with (a) preshaped noses, (b) roughness patches simulating antenna windows, (c) steps due to misaligned frusta, and (d) biconic frusta. The model was made of an epoxy material whose insulating and emissive properties facilitated data acquisition through the VKF infrared scanning camera. The IR data was digitized and converted to surface temperature values by means of an equation derived from the basic laws of radiation. Local heat transfer rates were then deduced from the temperature data under the assumption that the model's surface temperature history was that of a homogeneous, semi-infinite slab subjected to a constant heat transfer coefficient. Comparisons of transition onset and end deduced from the IR system data are shown to compare favorably with data deduced from models instrumented with thermocouples or gardon heat gages. (Author)

AD-A108 848/3 PC **A06**/MF **A01**
Science Applications, Inc., El Segundo, CA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume IX. Evaluation of Reentry Vehicle Nosetip Transition and Heat Transfer in the AEDC Hyperballistics Track G.
Final rept. Dec 77-Sep 79,
A. T. Wassel, W. C. L. Shih, and R. J. Curtis. Jan 81, 105p SAI-063-81R-051-VOL-9, BMO-TR-81-61-VOL-9
Contract F04701-77-C-0126
See also Volume 10, AD-A108 849.

Boundary layer transition and surface heating distributions on graphite fine weave carbon-carbon, and metallic nosetip materials were derived from surface temperature responses measured in nitrogen environments during both free-flight and track-guided testing in the AEDC Hyperballistics Range/Track G. Innovative test procedures were developed, and heat transfer results were validated against established theory through experiments using a super-smooth tungsten model. Quantitative definitions of mean transition front locations were established by deriving heat flux distributions from measured temperatures, and comparisons made with existing nosetip transition correlations. Qualitative transition locations were inferred directly from temperature distributions to investigate preferred orientations on fine weave nosetips. Levels of roughness augmented heat transfer were generally shown to be below values predicted by state of the art methods. (Author)

AD-A108 849/1 PC **A08**/MF **A01**
Science Applications, Inc., Irvine, CA. Material Sciences Operation.
Performance Technology Program (PTP-S II). Volume X. Material Characterization of Post-Test Ablation Models.
Final rept. Dec 77-Jan 80,
D. A. Eitman, and J. E. DeMichaels. Jan 80, 154p SAI-061-80-01-VOL-10, BMO-TR-80-40-VOL-10
Contract F04701-77-C-0126
See also Volume 11, AD-B061 591L.

Characterization data is presented on twenty-four carbon-carbon models which had been arc-jet ablation-tested and twenty-one erosion samples from various ground tests. Materials include several construction, processing and yarn types. The characterization information presented includes photomicrographs, measurements made using the photomicrographs and data from additional tests. The additional tests include mercury porosimetry, helium density, gas adsorption, bulk density and permeability. (Author)

AD-A108 850/9 PC **A03**/MF **A01**
Science Applications, Inc., Wayne, PA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume XII. Coupling of the CM3DT Inviscid Nosetip Flow Field Code to the Quick Geometry and Stein Afterbody Codes.
Final rept. Mar-Jun 80,
Darryl W. Hall, and Catherine M. Dougherty. Jun 80, 28p SAI-067-81R-014-VOL-12, BMO-TR-81-72-VOL-12
Contract F04701-77-C-0126
See also Volume 14, AD-A108 851.

The CM3DT inviscid blunt body code is modified to include the QUICK geometry description routine. A procedure is developed to couple the CM3DT code to the STEIN inviscid afterbody code. Instructions for the use of the modified CM3DT code with the QUICK and STEIN codes are included. (Author)

AD-A108 851/7 PC **A04**/MF **A01**
Science Applications, Inc., Wayne, PA. Applied Mechanics Operation.
Performance Technology Program (PTP-S II). Volume XIV. Extensions to the 3DSAP Approximate Inviscid Flow Field Code.
Final rept. Sep 80-Feb 81,
Darryl W. Hall, and Catherine M. Dougherty. Feb 81, 53p SAI-067-82R-006-V-14, BMO-TR-81-77-VOL-14
Contract F04701-77-C-0126
See also Volume 2, AD-A108 844.

The 3DSAP approximate inviscid flow field technique has been modified to permit treatment of flared multiconic afterbodies. The calculation of the flared afterbody section is performed using a discrete shock-fitting algorithm to accurately treat the embedded shock. Additional modifications have been incorporated into the code, allowing stretching of the body-normal coordinate grid and improving the treatment of expansion discontinuities on the multi-conic frustum. (Author)

16D. Missiles

AD-A108 810/3 PC **A07**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Modern Weapon-Guided Missile (Xiandai Wugi-Daodan),
Shaoqiu Liu, Xianlin Li, Mingdi Chen, and Zheng Lu. 27 Nov 81, 138p Rept no. FTD-ID(RS)T-1141-81
Edited trans. of mono. from National Defense Industry Publishing House, China, Jan 81 p1-116.

No abstract available.

AD-A109 180/0 PC **A09**/MF **A01**
Naval Surface Weapons Center, Dahlgren, VA.
Aerodynamic Design Manual for Tactical Weapons.
Final rept.,
Lawrence A. Mason, Leroy Devan, Frank G. Moore, and Donald McMillan. Jul 81, 178p Rept no. NSWC/TR-81-156

The Naval Surface Weapons Center Aeroprediction Code has been extensively applied to the prediction of static and dynamic aerodynamics of missile configurations. Major extensions have recently been made to the Code, extending its capability to 0 less than or equal to M (infinity) less than or equal to 8 and 0 degrees less than or equal to alpha less than or equal to 180 degrees and improving the transonic and dynamic derivative predictions. The theoretical basis for the Code is reviewed. The Code is evaluated through comparisons of computational examples with experiment for body alone, body-tail, and body-tail-canard configurations. The speed and accuracy of the Code is ideal for use in preliminary design. Representative design charts (generated by the use of the Code) for both the static and dynamic aerodynamic coefficients of a wide variety of configuration components are included. The charts will aid the designer in making preliminary design estimates or for data comparisons.

N82-14053/4 PC **A06**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Stability and Control Characteristics of a Monoplanar Missile Configuration with Triform-Tail-Fin Arrangements at Mach Numbers from 1.70 to 2.86.
M. Lamb. Dec 81, 119p NASA-TM-83223, L-14724

A wind-tunnel missile model with either a lower vertical tail fin with a pair of horizontal fins having 0 deg, 22.5 deg, or 30 deg dihedral or an upper vertical tail fin with horizontal fins having 0 deg, -22.5 deg, or -30 deg dihedral was investigated. The results indicated that those configurations with horizontal fins at or below the horizontal plane had nearly linear pitching-moment characteristics, while those with the horizontal fins above the horizontal plane experienced pitch-up which increased with increasing horizontal-fin-dihedral angle. At zero angle of attack, the configurations were directionally stable at most test Mach numbers. Generally, those configurations with the upper vertical fin had positive effective dihedral at zero angle of attack, while those with he lower vertical fin had negative effective dihedral. For roll control, three deflected tail fins produced more total roll control than two horizontal fins. For yaw control, three tail fins deflected equally or differentially produced more total yaw control than the single vertical fin.

N82-14054/2 PC **A07**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Pressure Distributions and Shock Shapes for 12.84 Deg/7 Deg on-Axis and Bent-Nose Biconics in Air at Mach 6.
C. G. Miller, Iii, and P. A. Gnoff. Dec 81, 127p NASA-TM-83222, L-14896

Pressure distributions and shock shapes on a spherically blunted, 12.84 deg /7 deg on axis biconic and a spherically blunted, 12.84 deg/7 deg bent nose biconic at Mach 6 in air were measured. The angle of attack, referenced to the axis of aft cone, was varied from 0 deg to 25 deg in nominal 5 deg increments. Two values of free stream Reynolds number based on model length were tested. Predictions from simple, theories and from a supersonic, three dimensional, external invsicid code (STEIN) are compared with measured values. Predicted STEIN shock shapes and windward pressures are in agreement with measured values for both biconics over the present range of angle of attack.

17.

NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A108 899/6 PC **A03**/MF **A01**
Edo Corp., College Point, NY. Government Products Div.
High Speed Sonar Array Depressor Program.
Final rept.,
R. F. Becker. 30 Nov 81, 48p
Contracts N00014-79-C-0585, N00014-80-C-0695
Sponsored in part by Contract N00014-80-C-0726.

This report describes a two-year program directed towards the development of a high-speed, lightweight depressor for towing a sonar array from surface ships. The report covers the design, fabrication and model basin test of a half scale model and the design, fabrication, model basin test and at-sea test of a full scale demonstration model. Results of the test program have verified the hydrodynamic performance and demonstrated the ease of handling a lightweight depressor. It is practical for a 265 pound (1180 N) depressor towing a sonar array at 35 knots to develop a depressing force of 7000 pounds (31,000 N). (Author)

AD-A109 273/3 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Spherical Acoustic Broadband Receiver.
Final rept.,
W. James Trott. 16 Dec 81, 42p Rept no. NRL-MR-4633

The development of a hydrophone array for determining signal bearing in three dimensions is described in theory and experiment. The array of omnidirectional

elements, on a spherical surface is shaded in amplitude to produce a frequency-independent directional response. Design of omnidirectional elements is discussed. (Author)

AD-A109 276/6 PC **A04**/MF **A01**
Defence Research Establishment Valcartier (Quebec).
Algorithms for Tracking a Sound Source Using Frequency and Bearings,
C. Kent. Sep 81, 66p Rept no. DREV-R-4199/81
Text in English; summary in French.

This report develops some of the analytical support for algorithms designed to permit one or more mobile searchers to track a sound source moving in a straight line. The searchers measure bearing and received frequency to infer range, the true frequency and velocity components. The measurements of bearing and frequency are subject to random errors. (Author)

AD-A109 418/4 PC **A03**/MF **A01**
SACLANT ASW Research Centre, La Spezia (Italy).
A Resume of Stochastic, Time-Varying, Linear System Theory with Application to Active-Sonar Signal-Processing Problems,
Lewis Meier. 15 Jun 81, 33p Rept no. SACLANTCEN-SR-50

This report summarizes linear time-varying systems theory and its application to active sonar signal processing when certain of the parameters are random variables. To keep the analysis within reasonable bounds the random parameters are described by their first- and second-order moments only. The report starts by outlining the theory and follows by describing two possible applications: one for the derivation of the scattering function of a moving, turning line target; the other in the use of pulse trains to measure scattering functions. (Author)

AD-A109 419/2 PC **A04**/MF **A01**
SACLANT ASW Research Centre, La Spezia (Italy).
Spatial-Gain Improvement Resulting from Left/Right Discriminating Elements of an Underwater Towed Array.
Memorandum rept.,
Ronald A. Wagstaff, and Pietro Zanasca. 15 Sep 81, 51p Rept no. SACLANTCEN-SM-152

The improvement in spatial gain of an underwater towed array as a result of left/right discriminating elements is investigated. This is accomplished by simulating the measurement of beam noise in a dynamic shipping distribution for a major ocean basin. Beam-noise measurements by a left/right discriminating array at six locations of various shipping densities are compared with the corresponding measurements by a conventional towed away. Cumulative distribution functions of the beam noise as a function of beamwidth are used as a basis for comparison. The results indicate that the additional spatial gain is non-linear with percentage of observations. It varies from about 2 dB for 80% to about 9 to 12 dB for 10% at some sites. At other sites it is considerably less and in some cases vanishes at the low percentages.

PB82-862699 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Submarine Detection Equipment. June, 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Feb 82.
Feb 82, 136p
Supersedes PB80-855208.

Articles and reports are cited that discuss submarine detection systems and related equipment. Magnetic anomaly detection, and active and passive sonar systems are included. Automatic sonar detection using computers and software for computer aided detection are considered. (This updated bibliography contains 111 citations, 47 of which are new entries to the previous edition.)

17B. Communication

AD-A108 761/8 PC **A07**/MF **A01**
Martin Marietta Aerospace, Orlando, FL. Computational Sciences Dept.
AN/FRC-170(V) Hybrid Computer Simulation.
Six months rept. Sep 79-Mar 80,
M. Keith Klukis, Thomas I. Lyon, and J. Kenneth Bishop. Feb 80, 139p Rept no. OR-15952
Contract DCA100-79-C-0048

This report describes and documents results of the first six months of hybrid computer simulations and communication systems modeling in support of transmission systems for the Defense Communications Agency. This effort has included the modeling and simulation of the Dual Diversity DRAMA Radio, dual line-of-sight frequency selective fading and Rayleigh fading channels, signal quality monitors, diversity selection combiner. A baseband equalizer concept was modeled and simulated for incorproation into the simulation.

AD-A108 783/2 PC **A05**/MF **A01**
Bolt Beranek and Newman, Inc., Cambridge, MA.
Combined Quarterly Technical Report Number 23. SATNET Development and Operation. Pluribus Satellite IMP Development. Remote Site Maintenance. Internet Operations and Maintenance. Mobile Access Terminal Network. TCP for the HP3000. TCP-TAC. TCP for VAX-UNIX.
Rept. for 1 Aug-31 Oct 81,
R. D. Bressler. Nov 81, 83p Rept no. BBN-4825
Contracts MDA903-80-C-0353, MDA903-80-C-0214
Sponsored in part by Contracts N00039-78-C-0405, N00039-80-C-0664 and N00039-81-C-0408. Continuation of contracts DAHC15-69-C-01769, F08606-73-C-0027, F08606-75-C-0032, MDA903-76-C-0214, MDA903-76-C-0252 and N00039-79-C-0386.

This Quarterly Technical Report describes work on the development of and experimentation with packet broadcast by satellite; on development of Pluribus Satellite IMPs; on a study of the technology of Remote Site Maintenance; on Internetwork monitoring; on shipboard satellite communications; and on the development of Transmission Control Protocols for the HP3000, TAC, and VAX-UNIX. (Author)

AD-A108 857/4 PC **A02**/MF **A01**
Rome Air Development Center, Hanscom AFB, MA. Deputy for Electronic Technology.
Gray Code Generation for MPSK Signals,
J. E. Ludman. 10 Oct 80, 5p Rept no. RADC/ETR-81-0015
Pub. in IEEE Transactions on Communications, vCOM-29 n10 p1519-1522 Oct 81.

No abstract available.

AD-A108 901/0 PC **A04**/MF **A01**
Range Commanders Council, White Sands Missile Range, NM. Documentation Group.
Universal Documentation System Handbook. Supplement 2. Procedures for the Electronic Transmission and Processing of Level 1, 2, and 3 Test Requirements and Support Information.
Final rept.
Oct 81, 55p Rept no. DG-501-79-SUPPL-2

This supplement describes the procedures for converting the Universal Documentation System (UDS) forms to a format more conducive to electronic transmission. The purpose of these procedures is to provide a standard format for electronic processing and transmission of the UDS forms which will be compatible with typewriters, optical character recognition readers, word processors, and high-speed computer printers.

AD-A109 003/4 PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
VLFACM Program Description and Operational Manual.
Final rept. on Phase 1,
J. P. Hauser, F. J. Rhoads, and F. J. Kelly. 24 Nov 81, 59p Rept no. NRL-8530

VLFACM is a FORTRAN computer program which can compute signal or noise-field strengths and signal-to-noise, signal-to-jam, or signal-to-jam-plus-noise ratios in the 14- to 3-kHz frequency range. Additional post-processing programs exist which can plot VLFACM results in the form of rectangular or polar contour maps, field strength versus distance plots, or diurnal plots. (Author)

AD-A109 004/2 PC **A04**/MF **A01**
Meteor Communications Consultants, Inc., Kent, WA.
Feasibility Study Utilizing Meteor Burst Communications for Vessel Monitoring.
Final rept. Sep 80-Apr 81,
R. E. Leader. Nov 81, 73p USCG-D-68-81, TSC-USCG-81-4
Contract DTRS57-80-C-00171

This document discusses the feasibility of using meteor burst communications for monitoring vessel position, in particular the Prince William Sound VMS near Valdez, Alaska. This document describes the equipment and operational performance of meteor burst in the telemetry of vessel position data. (Author)

AD-A109 125/5 PC **A06**/MF **A01**
Network Analysis Corp., Vienna, VA.
National Airspace Data Interchange Network (NADIN) Support of Remote Maintenance Monitoring System (RMMS).
Final rept.,
Dec 81, 111p NAC/FR-303J/01, FAA-RD-81/109
Contract DOT-FA79-WA-4335

National Airspace Data Interchange Network (NADIN) architectural enhancements necessary to support the Remote Maintenance Monitoring System (RMMS) and MMS programs are described. Several alternative approaches are formulated. These alternatives are compared and recommendations are made. It is found that: The NADIN backbone has sufficient capacity to handle initial RMMS traffic at adequate performance levels; An X.25 compatible interface for the NADIN and MPS connection is recommended; Additional frame routing capabilities at the NADIN concentrator and front end processors are required; and Future MPS communications will be best served by a fully distributed packet switched NADIN capable of supporting complete X.25 functions. (Author)

AD-A109 285/7 PC **A04**/MF **A01**
Vector Research, Inc., Ann Arbor, MI.
Information Management for an Automated Battlefield Command and Control System.
Interim rept. May 79-May 80,
Robert W. Blum, Cathleen A. Callahan, W. Peter Cherry, Donald Kleist, and Gregory Touma. May 80, 59p VRI-ARI-3-FR80-1, ARI-RR-1249
Contract DAHC19-78-C-0027
See also AD-A107 297, AD-A107 329, AD-A092 205 and AD-A092 206.

This executive summary presents synopses of seven documents produced in the second phase of a project to develop information management concepts and procedures for automated battlefield command and control (ABCC) systems. ARI Research Report 1248 (AD-A107 297) describes considerations in and procedures for the management of contemporary ABCC systems. ARI Technical Report 458 (AD-A107 329) presents an analysis of procedures for the extraction, summarization and presentation of critical information. ARI Research Note 80-12 (AD-A092 205) describes an analysis of information flow in the Tactical Operations System (TOS), an example ABCC system. ARI Research Note 80-13 (AD-A092 206) describes the mathematical model used in the information flow analysis. ARI Research Notes 80-14 and 80-15 describe the operation programming of the computer programs implementing the model. ARI Working Paper HF80-XX discusses design issues associated with the emerging All-Source Analysis System (ASAS) concept. (Author)

AD-A109 287/3 PC **A07**/MF **A01**
Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.
Bibliography: ARI Research on Command and Control (1970-80).
Technical rept.,
Edgar M. Johnson, Stanley M. Halpin, and Robert S. Andrews. Feb 81, 149p Rept no. ARI-TR-474

This bibliography was prepared as a reference to research publications in the command and control area by the U.S. Army Research Institute. Publications are divided into research areas and are listed in chronological order within each area. The major research categories are: system operations and aids; information processing and presentation; surveillance, reconnaissance, and target acquisition; command staff simulation and gaming; and exploratory research and supporting technology. An author index is included. (Author)

N82-14173/0 PC **A10**/MF **A01**
European Space Agency, Paris (France).
Ots: 3RD Year in Orbit.
Aug 81, 222p ISBN-0-8529-6244-4, ISSN-0537-9989

Presented at Intern. Conf. On Results of Tests and Expt. With the European Ots Satellite, London, 8-10 Apr. 1981.

No abstract available.

N82-14412/2 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Possibility of a New Approach to Processing Space Pulse Radio Signals.
A. A. Bocharov. Oct 81, 20p NASA-TM-76748, PR-605
Contract NASW-3541
Transl. Into English of "O Vozmozhnosti Novogo Podkhoda K Obrabotke Kosmicheskikh Impulsnykh Radiosignalov" Rept. Pr-605, 1980 p 1-8. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Inst. Of Space Research, Academy of Sciences (Ussr), Moscow.

A approach to the processing of space pulse radio signals, which makes it possible to achieve a high level of time resolution is proposed. The approach is based on the utilization of the Fourier transform of a radio pulse envelope in the interstellar medium effect. The conditions of applicability of the proposed method and the requirements for recording equipment are substantiated. Also indicated is the possibility of obtaining superresolution with the utilization of the given method of signal processing.

N82-14433/8 PC **A06**/MF **A01**
Standard Electrik Lorenz A.G., Stuttgart (Germany, F.R.).
Study on Digital Television Transmission Via a Television Broadcasting Satellite (Tv-Sat).
Final Report, Mar. 1980.
R. Burkhardt, H. C. Dinglinger, R. Faelker, A. Kemper, and H. Mitschke. Feb 81, 124p BMFT-FB-W-81-18, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Digital transmission and signal encoding methods with redundancy reduction were investigated for a television downlink from a satellite to the home receiver as an alternative method to analog FM transmission, the main criteria being bandwidth, carrier to noise ratio, picture quality and equipment costs at the receiving end. Digital PCM encoded and four phase shift key modulated transmission with a bandwidth of 22.4 MHz, giving very good picture quality, is proposed as advantageous for signal reception with small antennas. An alternative two channel transmission with 27 MHz bandwidth, using a higher order modulation method, is discussed. However, this proposal calls for a higher receiving antenna performance and is thus suitable for community antenna systems only.

N82-14434/6 PC **A06**/MF **A01**
Ecole Nationale Superieure des Telecommunications, Paris (France).
Activities of the Department of Systems and Communications Presentation et Compte Rendu d'Activites.
Annual Report, 1980-1981.
Mar 81, 122p ENST-D-81003
Text in French.

Systems theory, signal processing, and communication theory were studied. Signal analysis, synthesis, transmission and coding was investigated. The contribution of rapid development in integrated circuits to the mathematical analysis of communication problems is emphasized.

N82-14960/0 PC **A14**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Technical Communication: Perspectives for the Eighties, Part 1. Proceedings of the Technical Communications Sessions at the 32ND Annual Meeting of the Conference on College Composition and Communication.
J. C. Mathes, and T. E. Pinelli. Dec 81, 307p NASA-CP-2203-PT-1, L-14899
Conf. Held in Dallas, 26-28 Mar. 1981.

No abstract available.

PB82-132176 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 23-30.
Data file,
Sheryl Segal. 19 Aug 71, mag tape FCC/DF-81/031
See also Volumes 15-22, PB82-132218, and Volumes 31-38, PB82-132184.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132184 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 31-38.
Data file,
Sheryl Segal. 2 Feb 73, mag tape FCC/DF-81/032
See also Volumes 23-30, PB82-132176, and Volumes 39-46, PB82-132192.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132192 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 39-46.
Data file,
Sheryl Segal. 31 May 74, mag tape FCC/DF-81/033
See also Volumes 31-38, PB82-132184, and Volumes 47-54, PB82-132200.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132200 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 47-54.
Data file,
Sheryl Segal. 5 Sep 75, mag tape FCC/DF-81/034
See also Volumes 39-46, PB82-132192, and Volume 55, PB82-132234.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132218 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 15-22.
Data file,
Sheryl Segal. 22 May 70, mag tape FCC/DF-81/030
See also Volumes 6-14, PB82-132226, and Volumes 23-30, PB82-132176.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132226 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 6-14.
Data file,
Sheryl Segal. 8 Nov 68, mag tape FCC/DF-81/029
See also Volumes 1-5, PB82-132275, and Volumes 15-22, PB82-132218.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132234 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volume 55.
Data file,
Sheryl Segal. 17 Oct 75, mag tape FCC/DF-81/035
See also Volumes 47-54, PB82-132200, and Volume 87, PB82-132242.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132242 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decision File, Volume 87.
Data file,
Doris E. Stuck. Sep 81, mag tape FCC/DF-81/036
See also Volume 55, PB82-132234.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-132275 CP **T03**
Federal Communications Commission, Washington, DC. Computer Applications Div.
FCC Decisions Data File, Volumes 1-5.
Data file,
Sheryl Segal. 23 Dec 66, mag tape FCC/DF-81/028
See also Volumes 6-14, PB82-132226.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Data consists of decisions rendered by the Federal Communications Commission during Hearing Proceedings. Decisions are those that are primarily in the

areas of communication and broadcasting, and are limited to FCC's rulings. Hard copy form of this data is produced as FCC Reports.

PB82-142894 PC **A02**/MF **A01**
National Bureau of Standards, Washington, DC. Inst. for Computer Sciences and Technology.
A Discussion of Gridnet Simulation Results.
Rept. for 30 Nov 80-4 Sep 81,
R. T. Moore. Nov 81, 17p NBSIR-81-2414
Sponsored in part by Defense Nuclear Agency, Washington, DC.

The objectives of the program were to test and modify algorithms which would permit messages to be routed from any source to any destination, in a network having thousands of nodes, and to accomplish this routing in an efficient manner using only limited local knowledge of network operability status. In addition, estimates were developed of the network's daley and throughput characteristics as a function of traffic loading. Based on the simulation results, GRIDNET could be developed into a highly reliable and highly survivable data communications network that could support traffic between a large number of nodes in an effective and efficient manner.

PB82-153974 PC **A02**/MF **A01**
National Telecommunications and Information Administration, Boulder, CO. Inst. for Telecommunication Sciences.
Fiber Optic Communications - An Update.
Special pub.,
Joseph A. Hull. Oct 81, 25p NTIA-SP-81-14

Optical fiber communications technology has matured from laboratory and field trial stages to cost competitive operational systems. Changes in technology, which allow the use of longer wavelengths, continue to improve potential performance and provide the basis for major long-haul and undersea cable communication systems. Rapid progress in the development of standards is evident, both domestic and international. The evolution of optical fiber communications as a primary communications media rather than a selective replacement for existing communication links portends extensive change in the systems and services available. The report provides an assessment of the current status and some expectations for the future.

PB82-804022 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Land Mobile Communications. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 250p
Supersedes PB80-815293, and NTIS/PS-79/0992.

The cited research reports included studies on public policy, frequency allocation and management, licensee data, satellite relays, wave propagation, and equipment. (This updated bibliography contains 243 citations, 40 of which are new entries to the previous edition.)

PB82-861691 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Communication Satellites. 1974-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Feb 82.
Feb 82, 239p
Supersedes PB80-859507.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

The development of world wide communication via satellites is discussed in the cited reports. Emphasis is placed on television broadcasting and international communication. The design and development of antennas, problems associated with electromagnetic interference, and attitude control are considered. International law as applied to satellite communication is also included. (This updated bibliography contains 228 citations, 66 of which are new entries to the previous edition.)

PB82-862376 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Delta Modulation. September, 1971-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Sep 71-Feb 82.
Feb 82, 205p
Supersedes PB80-856651.

The articles cited discuss the theory and applications of delta modulation. Disturbance and noise filters, data encoding, and equipment design are considered. Applications include voice transmission and facsimile coding. (This updated bibliography contains 234 citations, 34 of which are new entries to the previous edition.)

PB82-862442 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Infrared Communications. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 282p
Supersedes PB81-860710.

Citations in this bibliography relate to the use of infrared light waves in communication. Descriptions of the design and implementation of devices using laser and thermal imaging for this purpose are included, as are properties and uses of various infrared transmitting materials. (This updated bibliography contains 256 citations, 56 of which are new entries to the previous edition.)

PB82-862459 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Infrared Communications. June, 1970-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Feb 82.
Feb 82, 91p
Supersedes PB80-852395.

Reports are cited which discuss the utilization of infrared light waves as a communication transmitting medium. Coherent IR receivers for laser communications and radar, infrared transmitting materials, infrared receiver performance evaluations, and digital controlled IR light wave broadcasting in diffused data links are among the topics discussed. infrared systems for determining ocular positioning for the severely handicapped is included as well as other applications in such areas as bioengineering, law enforcement, and industrial communications. (This updated bibliography contains 91 citations, 20 of which are new entries to the previous edition.)

PB82-862467 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Infrared Communications. June, 1974-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 74-Feb 82.
Feb 82, 223p
Supersedes PB80-852387.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography cites reports on the design, development, and applications of infrared radiation in communication. Innovations in equipment utilizing laser and thermal imaging are examined and evaluated. Infrared laser communication systems for near-earth intersatellite data links, performance evaluations of infrared transmitting materials, and infrared receiver performance are also included. (This updated bibliography contains 221 citations, 62 of which are new entries to the previous edition.)

17D. Electromagnetic and Acoustic Countermeasures

AD-A109 300/4 PC **A02**/MF **A01**
Ohio State Univ., Columbus. ElectroScience Lab.
Sophisticated Jammers and Adaptive Arrays.
Quarterly rept.,
R. T. Compton, Jr. Sep 81, 8p Rept no. ESL-713603-3
Contract N00019-81-C-0093

This report describes progress under Naval Air Systems Command Contract N00019-81-C-0093 for the second quarterly period. This contract involves studies on the effectiveness of two types of jamming against adaptive arrays: envelope modulated jammers and cross-polarized jammers. Our progress during the second quarter in these areas is described.

17E. Infrared and Ultraviolet Detection

AD-A108 812/9 PC **A05**/MF **A01**
Defence Research Establishment Valcartier (Quebec).
Detection Range Probabilities of Passive Infrared Systems for the North Atlantic,
A. Laflamme. Sep 81, 90p Rept no. DREV-R-4233/81
Abstract in French.

In this report the probabilities of extinction of infrared radiation in the atmosphere, range probabilities for target detection by passive infrared surveillance systems are presented. The geographic area covered is the North Atlantic. The two major atmospheric infrared windows, the 3 to 5 and the 8 to 12 micrometer bands, are considered. The results allow to predict and compare readily the performance of detection systems.

AD-A108 868/1 PC **A04**/MF **A01**
Utah State Univ., Bedford, MA. Electro-Dynamics Labs. (SRL).
Cryogenically Cooled Infrared Interferometric Spectrometers,
Ronald J. Huppi, and Allan J. Steed. 30 Jun 81, 52p EDL-SRL-81-1, SCIENTIFIC-2, AFGL-TR-81-0201
Contract F19628-78-C-0018

Very sensitive Fourier transform spectrometers (FTS's) have been developed for infrared measurements utilizing advanced technology to achieve stable operation at very low temperatures. All of the structural, optical, and detector components used to construct these spectrometers are cryogenically cooled to improve the sensitivity of their detectors and to eliminate unwanted background emission signals from the components. Various designs of cooled FTS systems which have been successfully used and tested by USU and AFGL are presented in the paper. The performance specifications, the advantages, and the limitations of each technique are discussed. Also, general evaluations of the advantages and the limitations of cooling an FTS are given. (Author)

AD-A109 261/8 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Beam Profile Shaping for Laser Radars That Use Detector Arrays.
Journal article,
Wilfrid B. Veldkamp. 1980, 7p MS-5426, ESD-TR-81-305
Contract F19628-80-C-0002
Pub. in Proceedings of the International Conference on Lasers p478-483, 15-19 Dec 80.

No abstract available.

PB82-149881 Not available NTIS
National Bureau of Standards, Washington, DC.
Errors in Passive Infrared Imaging Systems Due to Reflected Ambient Flux,
Joseph C. Richmond. 1980, 5p
Pub. in SPIE Infrared Imaging Syst. Technol. Proc., v226, p110-114 1980.

Passive infrared imaging systems produce a signal in which the amplitude at a particular spot is related to the radiance of the corresponding spot in the scene viewed. The differences in signal levels in different areas of the image is usually interpreted in terms of radiance temperature differences in the scene viewed, and may be converted to true radiance temperatures if the scene includes an object whose radiance temperature is known. The radiance temperatures are usually converted to true temperatures by correcting for the emittance of objects in the scene. This would be correct in the absence of reflected ambient flux. However, for scenes at ambient temperatures, ambient flux is always present in significant amounts. Temperature errors due to reflected ambient flux are discussed from a theoretical standpoint, and a procedure for experimentally evaluating the ambient flux is suggested.

17G. Navigation and Guidance

AD-A108 771/7 PC **A05**/MF **A01**
Eclectech Associates, Inc., North Stonington, CT.
Aids to Navigation Principal Findings Report on the Ship Variables Experiment: The Effect of Ship Characteristics and Related Variables on Piloting Performance.
Interim rept.,
W. R. Bertsche, D. A. Atkins, and M. W. Smith. Nov 81, 91p EA-81-U-022.1, USCG-D-55-81
Contract DOT-CG-835285-A

This experiment is one of a series done for the U.S. Coast Guard to quantify the relationship between variables related to aids to navigation and piloting performance in narrow channels and, potentially, safety in such channels. This is one of several experiments restricted to visual piloting, and further to buoys only. It was done on a simulator built for the U.S. Coast Guard at Eclectech Associates in North Stonington, Connecticut. The variables evaluated were: Ship Characteristics: an 80,000 dwt tanker with a rear bridge and an 80-foot height of eye versus a 30,000 dwt tanker with a midship bridge and a 45-foot height of eye; Size and Complexity of Bow Image: larger and smaller bow image for the 30,000 dwt tanker; Speed of transit: 6 knots versus 10 knots; buoy density: a three-buoy turn and short (5/8 nm) spaced, gated buoys versus a one-buoy turn and long (1-1/4 nm) spaced, staggered buoys; and Underkeel clearance: 1 foot versus 600 feet. Only selected combinations of these variables were included as scenarios in the experiment. Tasks and wind and current effects were varied within the scenarios. The findings are presented as the means and standard deviations of crosstrack position of transits under each condition. Observed differences in their inherent controllability parameters to provide a methodology for extrapolating the findings to a variety of ships not included in the experiment.

AD-A108 893/9 PC **A06**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Active Beacon Collision Avoidance System (BCAS) Logic Performance during Operational Flight Tests.
Rept. for 13 Jul-9 Sep 80,
R. A. Tornese, and A. L. McFarland. Jan 81, 123p MTR-80-W352, FAA-RD-80-138
Contract DTFA01-81-C-10001

Between 13 July and 9 September 1980, operational flight tests of an Active BCAS Experimental Unit (BEU) were conducted. The flight tests included 129 approaches to 28 different airports during 60 hours of flight: 14 unplanned encounters which gave rise to BCAS alerts were recorded. In each of the encounters, the aircraft carrying the BEU came into a conflict with another aircraft entirely by chance. The other aircraft was not associated with the BCAS test program in any way. The primary purpose of the flight tests was to determine how many unplanned alerts would occur during normal flight operations and to assess whether each was a desirable or unwanted alert. In addiiton, alert correctness, timeliness, and utility were considered along with the potential impact of BCAS on the ATC system. The data was also used to determine approximately the region(s) where desensitization of BCAS threat logic should be applied to limit unwanted alerts.

AD-A109 001/8 PC **A05**/MF **A01**
Cambridge Engineering, VT.
Engineering Analyses of Candidate Communication and Surveillance Techniques for the Vessel Traffic System.
Final rept. Sep 80-Apr 81,
Martin C. Poppe, Jr. Nov 81, 81p USCG-D-69-81, TSC-USCG-81-5
Contract DTRS57-80-C-00137

Coast Guard Vessel Traffic Service (VTS) facilities rely heavily on radio communications to acquire the location of vessels and disseminate this information to other interested shipping. As the communication requirements change, the Coast Guard must be knowledgeable of the options available to meet the new requirements. To provide a basis for future system expansion and design, this study explores the communication channels available to maritime mobile service and the impact of change from voice to voice/data and data/only communication. Analysis under Task I reviews all frequency bands available for maritime service, identifying for each band all permissable transmission methods. Task II considers three candidate systems. The performance of these systems was analyzed with respect to present and future communications requirements using statistical VTS communication data. The systems are described with respect to hardware requirements and are characterized by the attainable data transmission rate. Cost estimates are furnished for all equipment not normally carried on commercial seagoing vessels, as well as the cost of modifying existing equipment. As a result of this study, the following conclusions are stated: (1) The introduction of a voice-based periodic position reporting scheme will quickly saturate available communication channels; and (2) There are digital communication systems capable of expanding the capacity of existing communication channels.

AD-A109 178/4 PC **A04**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Solid State Instrument Landing System, Runway 31C AN/GRN-29. Initial Evaluation Report, Laughlin AFB, Texas. 1-22 September 1981.
Final rept.,
Alan B. Taylor, and David E. Thibodeau. 16 Nov 81, 69p Rept no. 81/66N-285

This report presents the results of the 1-22 September 1981 TRACALS evaluation and commissioning of the Laughlin AFB Runway 31C AN/GRN-29 SSILS. The evaluation was conducted to determine the capabilities and limitations of the system in its installed environment. Results presented in this report can be used as a guide for anticipated performance until there is a significant change in ground equipment, siting environment, horizon screening or operational use.

N82-14073/2 PC **A07**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Brunswick (Germany, F.R.).
Analysis of Two Air Traffic Samples in the Terminal Area of Frankfurt/Main, August 4TH 1978.
U. Voelckers, M. Schubert, and A. Seyfried. 1981, 127p DFVLR-MITT-81-12
Text in German.

Two 'arrival peaks' are analyzed. Computer programs used to combine data recorded from several sources are discussed. Traffic analysis includes quantitative evaluation of traffic density, studies of air traffic distributions relating to space and time, investigation of air traffic control procedures, determination of the approach control planning strategies, and a basic investigation of traffic vectoring in the terminal area. The similarities and differences of the two traffic samples are discussed.

N82-14074/0 PC **A06**/MF **A01**
Texas A and M Univ., College Station. Dept. of Electrical Engineering.
Design Studies for a Technology Assessment Receiver for Global Positioning System.
J. H. Painter. 15 Dec 81, 120p NASA-CR-165046
Grant NSG-1639

The operational conditions of a radio receiver - microprocessor for the global positioning system are studied. Navigation fundamentals and orbit characterization are reviewed. The global positioning system is descrbied with emphasis upon signal structure and satellite positioning. Ranging and receiver processing techniques are discussed.

N82-14075/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Design and Implementation of a Telecommunication Interface for the Taatm/Tcv Real-Time Experiment.
J. D. Nolan. Dec 81, 26p NASA-TM-83231, L-15021

The traffic situation display experiment of the terminal configured vehicle (TCV) research program requires a bidirectional data communications tie line between an computer complex. The tie line is used in a real time environment on the CYBER 175 computer by the terminal area air traffic model (TAATM) simulation program. Aircraft position data are processed by TAATM with the resultant output sent to the facility for the generation of air traffic situation displays which are transmitted to a research aircraft.

N82-14077/3 PC **A02**/MF **A01**
Ohio Univ., Athens. Avionics Engineering Center.
Commutated Automatic Gain Control System.
S. R. Yost. 1981, 25p NASA-CR-164798, TM-81
Contract NGR-36-009-017

A commutated automatic gain control system (AGC) was designed and constructed for the prototype Loran C receiver. The AGC is designed to improve the signal-to-signal ratio of the received Loran signals. The AGC design does not require any analog to digital conversion and it utilizes commonly available components. The AGC consists of: (1) a circuit which samples the peak of the envelope of the Loran signal to obtain an AGC voltage for each of three Loran stations, (2) a dc gain circuit to control the overall gain of the AGC system, and (3) an AGC amplification of the input RF signal. The performance of the AGC system was observed in bench and flight tests; it has improved the overall accuracy of the receiver. Improvements in the accuracy of the time difference calculations to within approx. + or - 1.5 microseconds of the observed time differnces for a given position are reported.

N82-14078/1 PC **A02**/MF **A01**
Ohio Univ., Athens. Avionics Engineering Center.
A Prototype Interface Unit for Microprocessor Based LORAN-C Receiver.
S. M. Novacki, III. Nov 81, 11p NASA-CR-164887, TM-82-NASA
Contract NGR-36-009-017

An inexpensive data/command entry and CRT display system capable of alphanumeric and graphics moe operation and designed to operate in place of a separate ASCII terminal, is documented. The software to interface this unit to the 6502-based Loran C receiver is also described. The system simplifies receiver operations to a level typical of current avionics systems.

N82-14438/7 PC **A03**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Oberpfaffenhofen (Germany, F.R.).
On the Accuracy of Radio Location in Media with Indirect Wave Propagation.
E. Sappl. Dec 80, 33p DFVLR-FB-81-02
In German; English Summary. Report Will Also Be Announced as Translation (Esa-TT-729).

The elimination of the errors of position determination systems, by appropriate evaluation of the measurements is based on radio frequency range measurements and operating in urban areas. Based on the statistical properties of the errors, the lower limit for the final position error is found which cannot be improved by any evaluation method. This limit is calculated for a system with four reference points at the corners of a square.

N82-14817/2 PC **A06**/MF **A01**
California State Univ., Fullerton.
Real Time Simulation of Computer-Assisted Sequencing of Terminal Area Operations.
Final Report, Jul. 1978 - Jan. 1981.
R. G. Dear. 31 Jan 81, 115p NASA-CR-166195
Contract NCA2-OR253-801

A simulation was developed to investigate the utilization of computer assisted decision making for the task of sequencing and scheduling aircraft in a high density terminal area. The simulation incorporates a desision methodology termed Constrained Position Shifting. This methodology accounts for aircraft velocity profiles, routes, and weight classes in dynamically sequencing and scheduling arriving aircraft. A sample demonstration of Constrained Position Shifting is presented where six aircraft types (including both light and heavy aircraft) are sequenced to land at Denver's Stapleton International Airport. A graphical display is utilized and Constrained Position Shifting with a maximum shift of four positions (rearward or forward) is compared to first come, first serve with respect to arrival at the runway. The implementation of computer assisted sequencing and scheduling methodologies is investigated. A time based control concept will be required and design considerations for such a system are discussed.

PB82-862624 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyroscopes and Gyro-Stabilized Systems. 1964-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1964-Feb 82.

Feb 82, 273p
Supersedes PB80-809049.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

Citations in this bibliography include theory, design developments, construction, and applications of gyroscopes. Fiberoptic, superconducting, electrostatic, microelectrostatic and nuclear magnetic gyroscope variations are among the subjects discussed. Such applications as verifications of Einstein's theories, missile guidance, inertial navigation, platform stabilization, and vibrational effects on gyroscope reliability are included. (This updated bibliography contains 295 citations, 158 of which are new entries to the previous edition.)

PB82-862632 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyroscopes and Gyro-Stabilized Systems. 1974-February, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1974-Feb 82.
Feb 82, 344p
Supersedes PB80-809056.

This bibliography cites reports concerned with the development, design, construction, and applications of gyroscopes. Nuclear magnetic resonance gyro theory and development, spacecraft navigation, superconducting gyroscope technology, and correction factors for gyroscope drift rate are among the topics discussed. Geophysical measurement and surveying technology are included with reference to gyroscope application. (This updated bibliography contains 398 citations, 201 of which are new entries to the previous edition.)

PB82-862640 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyroscopes and Gyro-Stabilized Systems. 1975-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1975-Feb 82.
Feb 82, 369p
Supersedes PB80-809031.

This bibliography cites technical reports on the theory, design, and fabrication of gyroscopes. Fiberoptic, electrostatic, microelectrostatic, cryogenic, and nuclear magnetic are among the developments in gyroscope technology that are discussed in this bibliography. Applications such as aircraft inertial navigation systems, apparatus for boresighting carrier based aircraft, and platform stabilization are included. (This updated bibliography contains 317 citations, 129 of which are new entries to the previous edition.)

PB82-862897 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyrocompasses. 1972-February, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Feb 82.
Feb 82, 182p
Supersedes PB80-809023.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

Citations in this bibliography include gyrocompass development, design technology, and applications. Navigation, inertial navigation, gyrocompass construction innovations, and variations of gyrocompass systems are included. Kalman electronic systems and strapdown systems are also discussed with reference to gyrocompass technology. (This updated bibliography contains 215 citations, 29 of which are new entries to the previous edition.)

PB82-862954 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Laser Gyroscopes. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 152p
Supersedes PB80-809114.

This bibliography cites technical reports on the design technology and engineering of laser gyroscopes. Ring laser quantum statistical theory, technology assessment and backscattering ramifications; optical gyroscopes compared to and contrasted with the laser interferometric system; and fiber ring optical gyroscope technology are among the subjects discussed. Performance evaluations of operational hardware are included. (This updated bibliography contains 132 citations, 60 of which are new entries to the previous edition.)

17H. Optical Detection

AD-A109 185/9 PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Accuracy of Parameter Estimates for Closely Spaced Optical Targets Using Multiple Detectors.
Technical rept.,
Keh-Ping Dunn. 23 Oct 81, 57p TR-589, ESD-TR-81-292
Contract F19628-80-C-0002
See also Rept. no. TN-1979-43, AD-A073 093.

In order to obtain the cross-scan position of an optical target, more than one scanning detector is used. As expected, the cross-scan position estimation performance degrades when two nearby optical targets interfere with each other. Theoretical bounds on the two-dimensional parameter estimation performance for two closely spaced optical targets are found. Two particular classes of scanning detector arrays, namely, the crow's foot and the brickwall (or mosaic) patterns, are considered. (Author)

N82-14439/5 PC **A02**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Oberpfaffenhofen (Germany, F.R.).
Results of a Slant Range Visibility Field Experiment with the Modified Dfvlr-Minilidar.
C. Werner. Jan 81, 21p DFVLR-MITT-81-01
In German; English Summary. Report Will Also Be Announced as Translation (Esa-TT-731).

The modified minilidar was used for a slant visual range experiment. The measured lidar visibility values were compared with: (1) in situ measurements from different heights above ground, using an instrumented tower; and (2) a slant installed transmissometer. The possibilities of the lidar two point method for practical application are shown.

17I. Radar Detection

AD-A109 011/7 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Modular Radar Analysis Software System (MRASS),
Douglas E. Forsyth, Carlton Bjerkaas, and Pio Petrocchi. 1981, 6p Rept no. AFGL-TR-81-0343
Pub. in Preprint Volume, Conference on Radar Meteorology (20th), p696-699, 30 Nov-3 Dec 81, Boston, MA.

No abstract available.

AD-A109 012/5 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
A Dual Frequency 10 CM Doppler Weather Radar,
Kenneth M. Glover, Graham M. Armstrong, Alexander W. Bishop, and Kenneth J. Banis. 1981, 8p Rept no. AFGL-TR-81-0341
Pub. in Preprint Volume, Conference on Radar Meteorology (20th), 30 Nov-3 Dec 81, p738-743, Boston, MA.

No abstract available.

AD-A109 036/4 PC **A02**/MF **A01**
Moore School of Electrical Engineering, Philadelphia, PA. Valley Forge Research Center.
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.
Annual technical rept. 1 Oct 80-30 Sep 81,
C. Nelson Dorny, and Bernard D. Steinberg. Nov 81, 18p UP-VFRC-40-81, AFOSR-TR-81-0836
Grant AFOSR-78-3688

This document describes progress toward development of a general capability for high resolution microwave surveillance and imaging using large, sparse, self-cohering arrays. During the last year progress has been made in the following areas: Assessment of the potential advantages of large self-cohering arrays, development of advanced system concepts (ground-based, airborne and spaced-based radio cameras), refinement of self-cohering techniques compatible with these system concepts, hardware testing of self-cohering techniques compatible with these system concepts, hardware testing of self-cohering techniques, and development of methods for enhancement of image quality associated with large sparse arrays. (Author)

PAT-APPL-6-325 454 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Precompression Bandwidth-Tolerant Digital Pulse Compressor.
Patent Application,
Frank F. Kretschmer. Filed 27 Nov 81, 21p AD-D009 071/2
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention relates generally to polyphase code systems and more particularly to digital systems for decoding sequences of polyphase encoded signals. In a conventional radar, the transmitted waveform is a train of pulses as shown. The average power is determined by the peak power and the duty ratio, that is to say the ratio of the width of the pulses to the overall repetition period T. T is generally fixed by the maximum unambiguous range, and tau by the resolution required. Thus, to improve the detectability of the radar only the peak power can be increased and this is limited by the components used. There is therefore a conflict of interests if both improved detectability and resolution are required.

18.

NUCLEAR SCIENCE AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

AD-A109 037/2 PC **A02**/MF **A01**
Saint Louis Univ., MO. Dept. of Physics.
Catoptric X-Ray Optical System (For Use in Laser-Fusion Diagnostics).
Annual technical rept. 1 Oct 80-30 Sep 81,
James F. McGee. 30 Nov 81, 20p AFOSR-TR-81-0865
Grant AFOSR-78-3480

A compound x-ray imaging device is being developed as an aid in the diagnostics of a laser-fusion process which involves a pellet about 100 microns in diameter. While previous reports have dealt with the use of certain aspheric surfaces in the x-ray imaging process, this report is confined to a thorough investigation of the use of Abbe's sine condition at grazing angles of incidence in the case of a single reflector. (Author)

AD-A109 041/4 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
The Cavity Q for Ergodic Eigenmodes.
Memorandum rept.,
Edward Ott, and Wallace M. Manheimer. 22 Dec 81, 8p Rept no. NRL-MR-4641

We consider here the problem of calculating the Q of a very overmoded, (wavelength $<<$ cavity size) irregularly shaped resonant cavity due to absorption of the electromagnetic radiation at the walls. We assume further that the volume inside the cavity can be either

vacuum, or else partially filled with anisotropic inhomogeneous dielectric or plasma. Both the scale length of the dielectric and the radius of curvature of the walls are assumed much larger than the radiation wavelength. However, near the cavity walls, a vacuum is assumed. Our main interest here is in applications concerning magnetically confined plasmas. For instance consider a tokamak containing a hot plasma which radiates at the cyclotron frequency and its harmonics. An important issue is how much of this cyclotron radiation is absorbed by the walls and how much is reabsorbed by the plasma. Generally this can be calculated with a ray tracing code where many rays are followed and the absorbtion and emission are calculated along each ray path. However if the plasma is optically thin, as it would be at the higher harmonics, and if the reflection coefficient at the wall is near unity the rays would have to be followed for long distances before one could see how much energy is deposited in the wall. In this paper we utilize the ergodic theorem to calculate the wall absorbtion for the case where the wave makes many bounces and before it is absorbed.

18B. Isotopes

PB82-155540 PC **A03**/MF **A01**
Scottish Universities Research and Reactor Centre, East Kilbride.
Irradiation Facilities and Radio-Isotope Production.
Dec 77, 36p SURRC-62/77

This report contains a brief outline of the facilities available for neutron, gamma-ray and X-ray irradiation at the Scottish Universities Research and Reactor Centre, together with a fairly comprehensive list of radioisotopes which can be produced on demand.

18D. Nuclear Instrumentation

AD-A108 774/1 PC **A03**/MF **A01**
Army Electronics Research and Development Command, Fort Monmouth, NJ. Combat Surveillance and Target Acquisition Lab.
Radiation and Temperature Tests of Cadmium Telluride Detectors.
Research and development technical rept. Oct 80-Oct 81,
Ockle E. Johnson. Nov 81, 36p Rept no. DELCS-TR-81-3

This report describes the testing of CdTe sensors together with front end electronics developed by Radiation Monitoring Devices, Inc for Radiac Division CS&TA Laboratory, Fort Monmouth, NJ. These new solid state sensors show promise, in terms of miniature size and sensitivity, toward the development goal of wrist-watch-sized military radiac. The unit was to operate from .01 mR/h to 1,000,000 mR/h using the least of number of sensors.

AEEW-R-1359 PC **A03**/MF **A01**
UKAEA, Winfrith (England). Atomic Energy Establishment.
Determination of the Residual Plutonium Masses in Glove Boxes, by Remote Measurements Using Solid Thermoluminescent Dosemeters.
H. E. Preston, and W. J. Symons. Oct 80, 40p
U.S. Sales Only.

A method has been developed to measure small quantities of plutonium in glove boxes using thermoluminescent dosemeters, (TLDs). Modifications to the detector and the use of solid forms of TLDs are described, together with their calibration and application to practical measurements. The method, accurate to plus or minus 20 percent for plutonium of known composition, is used remotely and does not interfere with the operation of adjacent boxes. Some indication is given of possible extension of the method to plutonium whose composition is in doubt, and the limitations of the method are discussed. (Atomindex citation 12:605347)

AERE-R-9693 PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Instrumentation and Applied Physics Div.
Cadmium Telluride and gamma-Ray Counting System.
J. H. Howes, and D. H. J. Totterdell. Jul 80, 9p
U.S. Sales Only.

This report describes an electronic system developed for operating Cadmium Telluride X and Gamma-ray detectors. Data is given on the performance of the detectors used as X and Gamma-ray spectrometers. (Atomindex citation 12:578275)

AERE-R-9701 PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Nuclear Physics Div.
Variable Dead Time Counters. 3. A Critical Analysis.
E. W. Lees, and B. W. Hooton. Mar 80, 12p
U.S. Sales Only.

This report presents further work on understanding the basic properties of variable dead time counters (VDC) used in the passive assay of plutonium by neutron counting of the natural spontaneous fission activity. The effects of neutron multiplication in the sample have been investigated both theoretically and experimentally for PuO sub 2 samples of well defined geometry and density. The analysis form for VDC proposed by Stanners is shown to work well for low mass samples, but to fail at the higher count rates corresponding to larger masses; the implications of this are discussed. Also investigated are the sensitivities of the VDC results to parameters such as the slow scaler dead time and the discriminator dead time. It is concluded that the VDC instrument works satisfactorily for low masses, but is an inherently limited form of analysis. (Atomindex citation 12:578276)

AERE-R-9871 PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Instrumentation and Applied Physics Div.
Semi-Automated Testing of Proportional Counters.
S. J. Sangwine. Oct 80, 14p
U.S. Sales Only.

A semi-automatic testing system for proportional counters has been built, using a desktop computer and the Harwell MOUSE module as the main components. The system is described and its advantages over manual testing outlined. (Atomindex citation 12:605599)

CEA-CONF-5224 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service des Techniques Instrumentales.
Multi-Step Avalanche Chambers for FNAL Experiment E605.
J. R. Hubbard, G. Coutrakon, M. Cribier, P. Mangeot, and H. Martin. Feb 80, 18p
U.S. Sales Only.

Physical processes in multi-step avalanche chambers, detector properties, and difficulties in operation are discussed. Advantages of multi-step chambers over classical MWPC for specific experimental problems encountered in experiment E605 (high-flux environment and CERENKOV imaging) are described. Some details of detector design are presented. (Atomindex citation 11:571495)

CEA-CONF-5226 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique des Particules Elementaires.
MORPION: A Fast Hardware Processor for Straight Line Finding in MWPC.
M. Mur. Feb 80, 15p
U.S. Sales Only.

A fast hardware processor for straight line finding in MWPC has been built in Saclay and successfully operated in the NA3 experiment at CERN. We give the motivations to build this processor, and describe the hardware implementation of the line finding algorithm. Finally its use and performance in NA3 are described. (Atomindex citation 11:571497)

CEA-CONF-5227 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique des Particules Elementaires.
Right-Left Ambiguity Resolution Using Field Corrector Readout in a Large Planar Drift Chamber.
B. Peyaud, J. Rander, and G. Tarte. Feb 80, 19p
U.S. Sales Only.

Induced signals on field corrector wires are used to resolve the right-left ambiguity in a large planar drift chamber. Efficient separation is obtained for +-3 cm drift cells, 4 meters long. Technical problems of the method, in particular the severe geometrical constraints, are discussed. Important features of the avalanche asymmetry can be inferred from the measurements. (Atomindex citation 11:571498)

CEA-CONF-5233 PC **A03**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Services d'Electronique.
Reliability and Monitoring in the Case of a Radiation Monitoring Panel at the CEN-Saclay.
P. Meriaux. Jun 80, 29p
In French.
U.S. Sales Only.

This paper deals with the assessment and monitoring of the reliability of a nuclear surveillance system, in this case, the radiation monitoring panel at the Centre d'Etudes Nucleaires of Saclay. (Atomindex citation 11:571500)

CEA-R-5041 PC **A04**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Protection contre les Rayonnements.
Investigation About Semiconductor gamma Ray Detector - Evaluation of Ge(Li) Detectors Life Expectation.
Jun 80, 56p
In French.
U.S. Sales Only.

A list of germanium lithium gamma ray detectors has been drawn up by a working group after investigations in various laboratories. Authors analyse the historical account of each detector and try to give an answer about some questions as: - detectors life expectation, - deficiencies and death reasons, - influence of detector type and volume. Differents parameters are also collected by the working group for future works (standard geometry, low level measurements, etc.). In the list, the characteristics of 228 detectors, collected between January 1965 and december 1977 are put together. The principal conclusions of the authors are: - with a probability of 95%, half of the detectors is dead before 6.1 years, - the average age of dead population (33% of detectors) is 3.9 years, - resolution and efficiency evolution are good indicators of possible deficiency, - the reiability of vertical cryostat is better than the other systems. (Atomindex citation 12:578279)

DE82001794 PC **A02**/MF **A01**
Stanford Linear Accelerator Center, CA.
Integrated Amplifier and Sample-and-Hold Analog Multiplexer Module.
D. Bernstein, and D. Hutchinson. 1981, 5p SLAC-PUB-2791, CONF-811012-3
Contract AC03-76SF00515
IEEE symposium on nuclear science, San Francisco, CA, USA, 21 Oct 1981.

The integrated amplifier and sample-and-hold analog multiplexer-ISHAM, is a proportional wire chamber analog readout module. It includes the front-end amplifier, the gated integrator and the sample-and-hold analog multiplexer. A density of 24 channels per module was achieved in a nonstandard multilayer P.C. board. Besides the above mentioned functions, the module provides: the control circuits for the Read-In and the Read-Out of the wire signals, the control circuits for the calibration of the 24 amplifiers, and the neutral trigger information. As an additional feature, the high voltage required by each wire is also supplied. The gain is 5V output voltage at 20 pC input signal charge. The equivalent input noise charge is 4 x 10 exp -15 C for the channel only and 6 x 10 exp -15 for the entire system. The nonlinearity is better than 0.1% f.s. and the crosstalk is less than 1%. The Z-position resolution achieved is 1%. (ERA citation 07:005288)

EUR-6813(V.2) PC **A99**/MF **A01**
Commission of the European Communities, Petten (Netherlands). Joint Nuclear Research Center.
Dosimetry Methods for Fuels, Cladding and Structural Materials.
H. Roettger. 1980, 641p CONF-791051-(V.2)

ASTM-EURATOM symposium on reactor dosimetry, Ispra, Italy, 1 Oct 1979.
U.S. Sales Only.

Abstracts for individual papers are included in the data base. (ERA citation 07:005170)

FEI-1053 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Efficiency of Cylindrical Detectors.
N. M. Blagoveshcenskij, and V. A. Parfenov. 1980, 11p
In Russian.
U.S. Sales Only.

No abstract available.

IFVE-ONF-79-125 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Track Reconstruction in Liquid Hydrogen Ionization Chamber.
V. I. Balbekov, A. M. Baranov, R. N. Krasnokutski, V. P. Perelygin, and E. A. Rasuvaev. 1979, 16p
U.S. Sales Only.

It is shown that particle track parameters can be reconstructed by the currents in the anode cells of the ionization chamber. The calculations are carried out for the chamber with 10 cm anode-cathode gap width. For simplicity a two-dimensional chamber model is used. To make the calculations simpler the charge density along the track is considered to be constant and equal to 10 exp 4 electrons/mm. The drift velocity of electrons is assumed to be 5x10 exp 6 cm/s. The anode is devided into cells 2 cm in width. The events in the chamber is defined with the coordinates X and Z of the event vertex, polar angles THETA of each track and track length l. The coordinates x, y and track angle THETA are reconstructed by currents with errors of up to millimetre and milliradian. The reconstruction errors are proportional to noise levels of electronics and also depend on the track geometry and argon purification. The energy resolution of the chamber is calculated for high energy electrons by means of computer program based on a Monte-Carlo method. The conclusion is made that the energy resolution depends on the gap width as a square root. Two ways to solve the track reconstruction problem are considered: (1) the initial charge density is determined by measuring the charges induced in anode strips at some discrete moments of time; and (2) the evaluation of the parameters is made by traditional minimization technique. The second method is applicable only for a not very large number of hypotheses, but it is less time consuming. (Atomindex citation 11:571507)

IFVE-OP-80-110 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
System of Multiwire Proportional Chambers at the Separated Particle Channel for the Mirabelle Bubble Chamber.
N. S. Bryukhanov, N. A. Galyaev, V. I. Kotov, B. V. Prosin, and Yu. A. Romanov. 1980, 15p
In Russian.
U.S. Sales Only.

A system of multiwire proportional chambers (MPC) operating on-line with a M-6000 computer used during tuning and monitoring of beam parameters in a separated particle channel for the Mirabelle bubble chamber is described. Peculiarities of the construction and main characteristics of two MPC versions are considered. The first version is intended for placing in a vacuum at the edges of high-frequency separator deflector, the second one - for placing outside a vacuum in ionoguide gaps. Power supply of the proportional chambers is carried out from local compact (160x95x50 mm) high-voltage sources remotely controlled from a channel panel by low voltage. A MPC position diagram in the accelerator channel, flowsheet of registering electronics for the MPC system, main circuits of high-voltage power source, analog-to-digital converter of a code and trunk amplifier are given. A graph of amplifier signal amplitude dependence on high voltage of a chamber for a different composition of a gaseous mixture is presented. (Atomindex citation 12:605604)

IFVE-OP-80-9 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Multichannel Fast Device for Analog Data Acquisition.
V. V. Vasil'ev. 1980, 8p
In Russian.
U.S. Sales Only.

A multichannel fast device for data acquisition from multiwire proportional and delta chambers is described. The analog data in the form of low voltages is directly commuted by linear keies made on the basis of MOSFET transistors with two isolated gates at the input of the common amplifier and then in the form of a histogram it is fed to the oscillograph with memory. The range of the commuted voltages is from 2x10 exp -4 up to 5x10 exp -1 V during the readout time for each wire which is from 1 mu s and more. (Atomindex citation 11:571508)

JINR-R-1-13037 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Methodical Aspects of Particle Decay Detection with Lifetime H< = 10 exp -13 S in Nuclear Photoemulsions.
K. D. Tolstov, A. A. Khushvaktova, and G. S. Shabratova. 1980, 5p
In Russian.
U.S. Sales Only.

Methodical possibilities of nuclear photoemulsions for detecting decays of short-lived particles at the distances upto 10 mu m from their birth production point - the primary star top are investigated. The investigation has been performed for angles between decay products euo.al to 1 deg, 5 deg and 11 deg. It is shown that at the angeles upto 2 deg the "noises" of measuring microscopes and ionization losses fluctuations on particle tracks from primary star do not permit to conclude unimagiously as to the existence of secondary particle centre at the distances upto 10 mu m from the primary star top. The increase in scattering angles allows one to advance to region of smaller distances. (Atomindex citation 11:571577)

JINR-R-10-12606 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Program Package for Express-Analysis of Geometrical Reconstruction Results and Event Kinematical Identification.
S. G. Badalyan, V. V. Glagolev, and V. G. Ivanov. 1979, 13p
In Russian.
U.S. Sales Only.

The program package for express-analysis of the calculation results by means of geometrical and kinematical programs is described along with its application in the film information processing system with JINR heavy liquid bubble chambers. Programs of package permit to carry out different methodical investigations at mathematical processing of chamber picture measurements and to raise the effectivity of computer use. The package is supplied with the means of program generation by users tasks in order to provide possibilities to work with program package for wide circles of users. The package programs are written in the FORTRAN algorithmical language in accordance with requirements of the HYDRA modular programming system. At present the express-analysis program package is widely used on the CDC-6500 computer. The program package occupies in the CDC-6500 storage 24-30 thous. words. The total time necessary for analysing 1000 events including the program receipt, constitutes 27-55 s. (Atomindex citation 11:571915)

JINR-R-10-80-162 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Data Compression at Filmless Readout of the Streamer Chamber Information. 1. Methodical Aspects and General Concepts of Compression.
I. Baila, G. A. Ososkov, and V. I. Prikhod'ko. 1980, 14p
In Russian.
U.S. Sales Only.

It is supposed that the system of filmless detecting and processing the visual information from "RISK" streamer chamber will comprise the effective on-line data compression algorithm. The role of the basic methodological principles of chamber image film processing in Righ Energy Physics for building up such system is analysed. On the basis of this analysis the main requirements are formulated that have to be fulfilled by the compression algorithm. The most important requirement consists in securing the possibility of the input data reprocessing, if problems in the off-line recognition occur. Using a vector system representation of primary data, the on-line data compression philosophy is proposed that embodies the following three principles: universality, parallelism and input data reconstructibility. Excluding of the recognition procedure from the on-line compression algorithm causes the compression factor reduction. (Atomindex citation 11:571918)

JINR-R-11-80-484 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Method for Syndrome Coding and Its Application to Fast Hardware Data Selection Based on the Processors Operating in the GF(2SUP(M)) Galois Field.
N. M. Nikityuk. 1980, 15p
In Russian.
U.S. Sales Only.

The method of syndrome coding for data compression read out from multiwire proportional chambers that has been previously proposed is generalized in case of its application to registration of the coordinates of events detected. The questions of execution of arithmetic and algebraic operations on the Galois field elements and their hardware implementation are considered. The method of computation is presented of a specialized processor for parallel computing the coordinates of three sparks. The estimate of its speed is equal to 185 ns. Data compression, data selection and coordinate calculations are performed without use of memory elements and timing pulses. (Atomindex citation 12:605865)

JINR-R-13-80-618 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Preamplifier for Multisection Liquid Argon Ionization Chamber.
Yu. K. Akimov, V. Kh. Dodokhov, V. A. Zhukov, A. I. Kalinin, and 1980, 4p
In Russian.
U.S. Sales Only.

A compact device of 24 preamplifiers intended for operation at low temperature (approximately 77 K) is described. Each preamplifier is placed on the 47x25 mm panel and has a gain of about 50. At the use of TiS-75 input transistor noises for 120 pF capacity are 5 keV for semiconductor detector and 90 keV for the liquid argon ionization chamber. The drift of all the device per day is not more than 1 channel. (Atomindex citation 12:616598)

JINR-1-80-303 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Holographic Registration of Electron Tracks in a Hydrogen Streamer Chamber.
A. Budziak, I. Ts. Ivanov, and V. S. Kozlov. 1980, 5p
In Russian.
U.S. Sales Only.

The holographic registration of electron tracks has been performed for the first time in a hydrogen chamber illuminated by light from a dye laser. A series of methods for obtaining holograms has been studied and Gabor holograms have been obtained of electron tracks in gaseous hydrogen medium. It is shown that the best experimental facilities are provided by registration of holograms with the help of an intermediate screen. (Atomindex citation 12:605617)

JINR-10-80-470 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Dept. of New Acceleration Methods.
Version of Serial Readout and Data Coding from Wire Detector Electronics.
T. V. Bespalova, I. A. Golutvin, and D. A. Smolin. 1980, 4p
In Russian.
U.S. Sales Only.

A controller version is described analysing at the readout from wire detector register only "non-zero" information for which selection a special analysing flip-flop circuit is used. "Zero" data is read with the 10 MHz frequency. For "non-zero" information reading a principle of a dialogue with chamber electronics is used. The controller provides the cluster regime of coding track coordinates and allows cascading of several shift registers to one input. A total controller circuit is placed

in a CAMAC unit of a unary width. (Atomindex citation 12:605619)

JINR-10-80-487 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Equipment Interface of CAMAC Hardware with ES-1040 Computer.
N. V. Gorbunov, Yu. P. Merekov, G. Kemnitz, I. Hernyes, and N. N. Khovanskij. 1980, 9p
In Russian.
U.S. Sales Only.

An interface unit (IU) is described which provides the communication between CAMAC hardware of a magnetic streamer chamber spectrometer and an ES-1040 computer. IU interacts with the computer and the controller of the driving CAMAC crate in such a manner that the number of channel program commands is minimal and the type of data exchange is identified without decoding of a CAMAC instruction. The loading of a CAMAC instruction into the controller proceeds with the "write" channel command, while its execution is started along with signals from the computer to the controller announcing about the transfer or reception of the current data word. In the case of information transfer to computer the first execution of the instruction is initiated by the "read" channel command. The exchange completion is induced by the "work stop" signal generated when the controller sets the demand flag after the end of execution of an instruction. The interface unit allows a high speed data exchange while keeping functional flexibility and being simple enough in its design. (Atomindex citation 12:605620)

JINR-10-80-664 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Generation System of Programs for Checking Results of Chamber Photograph Measurements.
S. G. Badalyan, V. G. Ivanov, and T. A. Strish. 1980, 12p
In Russian.
U.S. Sales Only.

The generation system of programs for checking the results of chamber photograph measurements is described. The programs make use of the possibilities of the Hydra modular system and are organized as a PAM file. The programs of the package allow one to obtain data on precision of chamber photograph measurements for any of JINR measuring facility, to estimate the number of good measured events, to get the analyzed event image and to correct coordinate values of fiducial points. The advantage of application of CCL procedures make it possible to simplify considerably the process of relations of a user with a program package and its information system and to develop a general generation system both in a package and in an interactive modes. The programs operate on a CDC-6500 computer under NOS/BE-1 operation system and make use of PATCHY-4 editor. (Atomindex citation 12:616778)

JINR-13-80-36 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Large-Solid-Angle Scintillation Hodoscope-Spectrometer for Investigation of Reactions with Low Energy Pions.
Yu. K. Akimov, I. I. Gaisak, D. Dorchioman, D. Lazarovich, and S. I. Merzlyakov. 1980, 10p
In Russian.
U.S. Sales Only.

A scintillation hodoscope for the investigation of reactions with up to 100 MeV pions is described. The investigation can be carried out with solid and gas targets with registration of reaction products in the range 20 deg-160 deg. To separate and identify reaction products, double layer detectors with organic and inorganic CsI(Tl) scintillators have been used. Resolution of detectors on particle spectrometry is better than 10%. Possibilities of measuring the elastic scattering of pions on protons and the total cross section of (pi exp + , pi exp 0) reaction are examined. The estimations of background conditions and the results of tests on the pion beam of JINR synchrocyclotron are presented. (Atomindex citation 11:571576)

JINR-13-80-402 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Set-Up for Continuous Control of Radon Concentration in Water.
I. V. Kuznetsov, and G. I. Koval. 1980, 3p
In Russian.
U.S. Sales Only.

A set-up for continuous control of radon concentration in water is described. It consists of a chamber in which radon is extracted from water, a standard unit for registrating alpha -particles, a counting unit and a logger. The set-up can be used to predict earthquarks by observing time variations of radon concentration in waters. A low concentration (about = approximately 10 exp -10 curie/liter) of radon in water could be controlled. (Atomindex citation 12:605319)

JINR-13-80-403 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Deuterium Track-Sensitive Target in a Hydrogen Bubble Chamber.
S. G. Sazonov, and V. T. Tolmachev. 1980, 8p
In Russian.
U.S. Sales Only.

The possibility of deuterium target applications in hydrogen medium is studied. This work is aimed at choosing the operating parameters for a deuterium-hydrogen system and determining the main requirements of a target design. Required target wall thickness is calculated. Optical distortions due to hydrogen convection around the target are evaluated. The principal scheme for deuterium target placed in hydrog.en bubble chamber is given and the basic relations to calculate the elements of target expanded joint are obtained. The study shows the feasibility of technical implementation of track-sensitive target within the selected working parameters and it can serve as a base for design development. (Atomindex citation 12:605621)

JINR-13-80-535 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Microchannel Plates in Experimental Nuclear Physics.
V. D. Dmitriev, S. M. Luk'yanov, Yu. Eh. Penionzhkevich, and D. K. Sattarov. 1980, 24p
In Russian.
U.S. Sales Only.

The presently available data on different characteristics of microchannel plates are briefly reviewed, and possible applications of these plates in experimental physics are considered. The electron multipliers manufactured in the form of microchannel plates have recently been widely used in various fields of science and technology. Good time characteristics, a high position sensitivity, an adequate detection efficiency for gamma -rays, electrons and ions with energies up to several hundreds of keV make the microchannel plates a promising instrument for use as detectors and their component parts in different nuclear-physical studies. (Atomindex citation 12:605623)

KURRI-TR-190 PC **A04**/MF **A01**
Kyoto Univ., Osaka (Japan). Research Reactor Inst.
Short-Term Study Meeting on Solid State Track Detection of Radiations.
S. Twata. 1979, 69p CONF-7805226-(Sum.)
In Japanese.Meeting on solid state track detection of radiations, Kumatori, Osaka, Japan, 29 May 1978.
U.S. Sales Only.

Individual papers were indexed separately. (ERA citation 07:005277)

NIIAR-23(431) PC **A02**/MF **A01**
Nauchno-Issledovatel'skii Inst. Atomnykh Reaktorov, Dimitrovgrad (USSR).
Model for Current Kinetics of a Direct Charge Rhodium Detector in a Two-Group Neutron Field and Algorithm for Flux Density Reconstruction.
Yu. M. Karatsuba. 1980, 21p
In Russian.
U.S. Sales Only.

A current kinetics equation in a two-group nonstationary neutron field is sequentially derived for the direct charge rhodium detector. A structure of concentrated macroparameters of the kinetics model is obtained. It is shown that if distributions over an emitter of radioactive nuclei, contributed to their appearance of thermal and epithermal components of a neutron field, are close to each other, the inverse problem of density thermal flux recovery over measured detector current is linear. A compact analytical solution of the inverse linear problem has been proposed. The macroparameters of the kinetics model are integrated into the complexes the number of which is required as a minimum for flux restoration. It is shown that these complexes may be experimentally found by the methods conventional for identification of linear system parameters and for experimental study of neutron fields. (Atomindex citation 12:605700)

NRPB-IE-19 PC **A02**/MF **A01**
National Radiological Protection Board, Harwell (England).
Instrument Evaluation No. 19. Wogan Radix 2000 Radiation Survey Meter.
P. H. Burgess, and W. J. Iles. Jun 80, 13p
U.S. Sales Only.

The Radix 2000 is a portable, battery-operated, exposure rate meter covering the range from 0.1 to 1000 mRh exp -1 . It is manufactured by G.J. Wogan and Co. Ltd, Bagshot, Surrey. The instrument is designed to measure X- and gamma -radiation over the energy range of 45 keV to 2 MeV. The radiation detector is an energy-compensated Geiger-Mueller tube. The facilities and controls of the instrument and its radiation, electrical, environmental and mechanical characteristics were evaluated and are compared with the requirements of the International Electrotechnical Commission. The instrument was found to be suitable for the measurement of X- and gamma -radiation above an energy of 40 keV at intensities between approximately 0.3 and 300 mRh exp -1 . It was found to have good energy response and polar response, and good battery life, but linearity on the higher decade of each range, as well as some aspects of the design and construction of the instrument, were found to be poor. The cost in March, 1980 was Pound200. (Atomindex citation 12:605627)

NRPB-IE-20 PC **A02**/MF **A01**
National Radiological Protection Board, Harwell (England).
Instrument Evaluation No. 20. Unit Inspection U3C Radiation Survey Meter.
P. H. Burgess, and W. J. Iles. Jun 80, 12p
U.S. Sales Only.

The Unit Inspection U3C is a portable, battery-operated, exposure rate meter covering the range from 0.1 to 1000 mRh exp -1 . It is manufactured by the Unit Inspection Co., Swansea, and marketed by Testrade Ltd., West Drayton, Middlesex. It is designed to measure X- and gamma -radiation over the energy range 30 keV to 3 MeV. The radiation detector is an energy-compensated Geiger-Mueller tube. The facilities and controls of the instrument and its radiation, electrical, environmental and mechanical characteristics were evaluated and are compared with the requirements of the International Electrotechnical Commission. The instrument was found to be a good general purpose exposure rate meter with a wide dynamic range (0.2 mRh exp -1 to 1 Rh exp -1), good energy response and reasonably good polar responses, long battery life, and good general standard of design and construction. The cost in February 1980 was Pound240. (Atomindex citation 12:605628)

PB82-149808 Not available NTIS
National Bureau of Standards, Washington, DC.
Source Imaging Using Neutron Pinhole Cameras Based on Position-Sensitive Proportional Counters.
Final rept.,
R. G. Johnson, J. W. Behrens, and C. D. Bowman. Dec 81, 4p
Pub. in Nuclear Technology 55, p724-727 Dec 81.

A pinhole camera technique has been used to measure the variation in neutron emission intensity over the area of the neutron-producing target of the National Bureau of Standards Electron Linac. The method uses a one-dimensional position-sensitive proportional counter (PSPC) with an intrinsic spatial resolution of 1.0 mm. The pinhole is made in a thick sheet of cadmium, and neutron energy (<0.3-eV) selection is achieved by time-of-flight. In a completely separate experiment, the neutron cone obtained from the (d,t) reaction using the associated-particle technique was imaged by a two-dimensional PSPC. This second measurement demonstrated the use of the two-dimensional detector for imaging high-energy (14-MeV) neutrons.

PB82-153313 Not available NTIS
National Bureau of Standards, Washington, DC.
Comparison of Experimental and Theoretical Ionization Yield Spectra for Neutrons,
R. S. Caswell, J. J. Coyne, and L. J. Goodman. 1981, 12p
Grant PHS-CA-26313-02
Sponsored in part by Department of Energy, Washington, DC. Office of Health and Environmental Research.
Pub. in Proceedings of Symposium on Neutron Dosimetry (4th), Held at Munich-Neuherberg, Germany on June 1-5, 1981, Paper in Radiation Protection, n1 p201-212 1981.

Measurements with tissue-equivalent proportional counters are used in neutron dosimetry to indicate the quality of the radiation. What is effectively measured is the ionization yield spectrum. However, the energy deposition spectrum is usually desired. These two spectra will differ if the ionization yield (E/W) varies as a function of secondary ion type and energy. In the past the authors have calculated energy deposition spectra, and compared them to experimental ionization yield spectra. Our analytic energy deposition code has been modified to produce ionization yield spectra as well as energy deposition spectra. These newly-calculated ionization yield spectra are compared with both walled and wall-less tissue-equivalent proportional counter spectra. Calculated ionization yield spectra are also compared with calculated energy deposition spectra. This permits evaluation of the differences which are useful in interpretation of the experimental proportional counter spectra.

RL-80-082 PC **A03**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Charge-Coupled Devices for Particle Detection with High Spatial Resolution.
F. J. Farley, C. J. S. Damerell, A. R. Gillman, and F. J. Wickens. Oct 80, 28p
U.S. Sales Only.

The results of a study of the possible application of a thin microelectronic device (the charge-coupled device) to high energy physics as particle detectors with good spatial resolution which can distinguish between tracks emerging from the primary vertex and those from secondary vertices due to the decay of short lived particles with higher flavours, are reported. Performance characteristics indicating the spatial resolution, particle discrimination, time resolution, readout time and lifetime of such detectors have been obtained. (Atomindex citation 12:605637)

SAAS-258 PC **A02**/MF **A01**
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German D.R.).
Application of CAMAC in Low-Level Activity Measurements.
V. Loessner. 1980, 20p
In German.
U.S. Sales Only.

A description is given of the measuring and data processing facilities designed for use in the bioassay laboratory which is now under construction in the SAAS. The detector units, especially alpha and quantum spectrometers, are linked to a PDP11/34 based CAMAC system enabling fully-automatic data acquisition and processing operations to be made by making use of an event-driven technique via CAMAC interrupts. (Atomindex citation 11:571593)

SAAS-265 PC **A02**/MF **A01**
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German D.R.).
Measurement of Radon in the Breath.
W. Schlueter. 1980, 14p
In German.
U.S. Sales Only.

A method is described for determining low radon concentrations in the exhaled air of persons to be examined for internal radium contamination. It involves the following steps: (1) sampling and adsorption of radon on activated charcoal at -90 exp 0 C; (2) desorption and transfer or radon to an alpha-scintillation counting system; (3) determination of the radon content. For a 30-min sampling period, the 3sigma error of the overall background corresponds at best to a radium body burden of about 3.7 Bq. (Atomindex citation 11:571594)

UM-P-80/36 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Experimental Determinations of Directional - Correlation Solid-Angle Attenuation Factors for Ge(Li) gamma -Detectors; Comparison of Experimental and Calculated Values.
H. H. Bolotin. 1980, 39p
U.S. Sales Only.

A modification and refinement of a technique to expermentally determine the solid-angle attenuation factors for finite Ge(Li) or high-purity Ge gamma-ray detectors in angular correlation/ distribution measurements is presented. The modified method is described, a detailed exposition and assessment of its inherent uncertainties presented, and comparisons are made with versions of it proposed earlier. Experimental determinations of the attenution factors obtained by use of this modified technique are critically compared with calculated values for the same detector and experimental particulars. The overall advantages and disadvantages of the use of the technique in preference to reliance on calculated attenuation factors are considered, evaluated, and assessed. The modified technique is found to be appropriate and to allow, both in theory and practice, accurate and precise determinations of the attenuation coefficients to be made. We nevertheless conclude that available calculational techniques are highly reliable and, at the same time, to be preferred on practical grounds. (Atomindex citation 12:605639)

ZfK-414 PC **A02**/MF **A01**
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German D.R.)
Efficiency Calibration of NE 213 Scintillators.
H. Guratzsch, J. Moesner, and G. Schmidt. Jun 80, 10p
In German.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Detection efficiencies of two neutron detectors with NE 213 scintillators were measured between 6 and 16 MeV. The detectors have been used in an experiment determining the neutron-neutron effective range. In order to obtain efficiency values as they were realized in the special shielding arrangement of this experiment time-of-flight spectra of neutrons scattered on polyethylene and graphite were measured at neutron energies 8.7, 11.5 and 14.7 MeV. The efficiency was derived from the number of neutrons scattered on the hydrogen of the polyethylene scatterer. The spectra were simulated by Monte Carlo technique using the Stanton code for the efficiency values and approximated by analytic functions. Normalization factors have been determined by fitting the simulated spectra to the experimental ones using the chi exp 2 minimum method. These factors were used to correct the efficiency curve resulting from the Stanton code. The energy dependence of this curve was also compared with the measurement performed by Drosg. (Atomindex citation 11:571595)

18E. Nuclear Power Plants

NUREG/CR-2367 PC **A04**/MF **A01**
IRT Corp., San Diego, CA.
Updated Best-Estimate Loca Radiation Signature.
Final rept.,
D. D. Thayer, D. H. Houston, and N. A. Lurie. Aug 81, 53p IRT-6406-002, SAND-81-7159

Proper radiation qualification of nuclear power plant equipment depends upon estimating the radiation environment in which equipment will be expected to perform. Over the past several years, the Qualification Testing Evaluation (QTE) Program being conducted by Sandia Laboratories for the U.S. Nuclear Regulatory Commission has been addressing the problem of radiation source term definition. As part of the QTE Program, IRT Corporation has conducted studies (Refs. 1-4) focusing on expected source terms resulting from the hypothesized loss-of-coolant accident (LOCA). The objective of the study was to review research conducted since the last study and make modifications and improvements in the 'best-estimate' LOCA radiation signature. This report contains a review of the fission product source terms literature since 1978, changes made in the 'best-estimate' source term, comparisons with the previous 'best-estimate' source term in Ref. 4, and suggestions for future work.

NUREG/CR-2450 PC **A09**/MF **A01**
Portland Cement Association, Skokie, IL. Construction Technology Labs.
Shear Transfer in Large Scale Reinforced Concrete Containment Elements. Report No. 2.
Technical rept.,
R. G. Oesterle, and H. G. Russell. Dec 81, 180p
See also NUREG-CR-1374.

The report presents results of an experimental program to investigate shear transfer in a cracked containment vessel without diagonal reinforcement. The test setup was designed and constructed to simulate boundary conditions of a wall element of a pressurized containment subjected to tangential shear stresses. The experimental program included monotonic and reversing load tests on large-scale specimens subjected to biaxial tension and shear. The specimens were 5-ft square and 2-ft thick with No. 14 and No. 18 reinforcement. Results of three monotonic and two reversing load tests are given. Test variables were level of biaxial tension and monotonic or reversing shear load. Observed behavior, strength, and deformations are discussed. Tentative design recommendations are presented.

NUREG-0485-V3-N13 PC **A06**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Management and Program Analysis.
Systematic Evaluation Program Status Summary Report: November 1-30, 1981.
Dec 81, 108p
See also NUREG-0485-V3-N5.

The Systematic Evaluation Program is intended to examine many safety related aspects of eleven of the older light water reactors. This document provides the existing status of the review process including individual topic and overall completion status.

NUREG-0486 PC **A10**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Operation of LaSalle County Station, Units 1 and 2, Commonwealth Edison Company, Docket Nos. 50-373, and 50-374.
Final environmental statement.
Nov 78, 216p

A Final Environmental Statement for the LaSalle County Nuclear Station, Unit Nos. 1 and 2, proposed for operation by Commonwealth Edison Company has been prepared by the Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission. This statement provides a summary of environmental impacts and beneficial and adverse effects of the proposed operation of the facility. Also included are comments of governmental agencies and other individuals on the Draft Environmental Statement and staff responses to these comments. On the basis of the analysis and evaluation set forth in the Final Environmental Statement, and after weighing the environmental, economic, technical and other benefits against environmental costs and after considering available alternatives, the NRC staff has concluded that the action called for is the issuance of operating licenses for Units 1 and 2 of the LaSalle County Station, subject to conditions for the protection of the environment.

NUREG-0540-V3-N9 PC **A21**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Technical Information and Document Control.
Title List of Documents Made Publicly Available, September 1-30, 1981.
Sep 81, 478p
See also NUREG-0540-V3-N1.

This document is a monthly publication containing descriptions of information received and generated by the US NRC. This information includes (1) docketed material associated with civilian nuclear power plants and other uses of radioactive materials and (2) non-docketed material received and generated by NRC pertinent to its role as a regulatory agency. The docketed information includes information formerly issued through the U.S. Department of Energy's Technical Information Center under the title Power Reactor Docket Information (PRDI). This document replaces PRDI, which will no longer be prepared. This document contains the following indexes: Personal Author Index, Corporate Source Index, and Report Number Index.

18F. Radiation Shielding and Protection

AERE-R-9586 PC **A03**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Chemistry Div.
Computation of Ion Implantation Uniformity.
W. Temple, D. G. Beanland, and A. N. Bridgwater. Feb 80, 50p
U.S. Sales Only.

Commercial ion implanters employ a variety of different systems to scan the ion beam over the target. In many of the target scanning systems employed the achievable uniformity of dose has been limited by the chosen geometry. This paper describes a computer program which has been used to calculate the dose uniformity of a number of these systems. The results are presented as iso-dose lines relative to the dose at the centre of the target. The non-uniformities are then directly apparent and the parameters controlling their magnitude can be readily considered by equipment designers, purchasers or users. (Atomindex citation 12:576341)

DE82001871 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Comparison of Various Flux Limiters and Eddington Factors.
G. C. Pomraning. 16 Oct 81, 23p UCID-19220
Contract W-7405-ENG-48

Various flux limiters and Eddington factors which have been suggested and are in use are analytically and numerically compared. A relationship between these two quantities is derived and used in this comparison to illuminate qualitative misbehavior in some instances. It is concluded that, in general, flux limiters and Eddington factors which follow from some underlying analysis all behave properly and are in semi-quantitative agreement. Hence it is probably difficult, if not impossible, to single out any one as best. On the other hand, all of the ad hoc flux limiters and Eddington factors examined suffer, in general, from some qualitatively incorrect behavior. (ERA citation 07:006261)

EFI-364(22)-79 PC **A03**/MF **A01**
Erevanskii Fizicheskii Inst. (USSR).
High Energy Particle Channeling.
S. M. Darbinyan, and K. A. Ispiryan. 1979, 28p
In Russian.
U.S. Sales Only.

The motion of relativistic positive and negative particles in the cases of axial and planar channeling is considered theoretically. The channeling fraction and the distribution in the transversal plane for high energy particles passing through crystals are calculated. (Atomindex citation 11:563186)

EFI-378(36)-79 PC **A02**/MF **A01**
Erevanskii Fizicheskii Inst. (USSR).
Possibility of Experimental Investigation of the Landau-Pomeranchuk Effect in Monocrystals at GeV Energies.
A. T. Margaryan. 1979, 13p
In Russian.
U.S. Sales Only.

Possibility of experimental investigation of the Landau-Pomeranchuk effect in monocrystals at approximately GeV energies is considered. This possibility appears under definite conditions as a result of gamma -quanta and high energy electrons interaction with the substance which density exceeds amorphous substance density approximately 1000 times. The essence of the effect is studied on bremsstrahlung example. Presented is the ratio of bremsstrahlung differential cross section as well as electron-positron pair production by gamma -quanta calculated using the Migdal formula to analogous Bethe-Heitler sections for tungsten at several energy values. It is shown that noticeable deviations from the Bethe-Heitler theory is observed in the bremstrahlung spectrum beginning from 2 GeV, and for pair production even at higher energies. (Atomindex citation 11:567937)

EFI-384(42)-79 PC **A02**/MF **A01**
Erevanskii Fizicheskii Inst. (USSR).
Determination of Interference Absorption Coefficient of Germanium in the Case of pi -Polarization by Means of Synchrotron Radiation.
I. P. Karabekov, D. L. Egikyan, R. A. Mikaehlyan, V. G. Bagdasaryan, and L. I. Datsenko. 1979, 15p
In Russian.
U.S. Sales Only.

The present work is devoted to experimental determination of interference absorption coefficient mu sub(i pi) of germanium using synchrotron radiation of the Yerevan electron accelerator. The value of mu sub(i pi) was determined using the measurements of the Laue diffractions intensity in both electron orbit and the perpendicular planes. The obtained value mu sub(i pi)=30.1 cm exp -1 well agrees with the calculated one which is equal to 28.9 cm exp -1 . (Atomindex citation 11:563187)

FEI-965 PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Study on the Self-Diffusion in Water by the Slow Neutron Quasi-Elastic Scattering Method. Pt.1. Experiment and Preliminary Data Processing.
S. M. Iskenderov, and A. G. Novikov. 1979, 28p
In Russian.
U.S. Sales Only.

The purposes of the study were: investigation of quasi-elastic scattering (QES) of slow neutrons by water throughout the temperature range of its liquid phase existence; obtaining the data on temperature dependence of self-diffusion process in water; interpretation of the obtained physical data on the basis of the present conceptions of structural-dynamic features of water. A neutron source is the IBR-30 reactor of 15 kW average power having 5 Hz power pulse-repetition rate. Initial neutron energy amounts to 8 and 25 MeV. A pair pulse neutron spectrometer of 0.58 and 2.4 MeV resolution with respect to the initial energy was used to measure neutron spectrum. Measurements were carried out at 300, 400, 500, 548, 600 and 623 K temperatures. The specimen represents a cylinder of 160 mm height and 120 mm diameter consisting of capillary tubes filled with water. The specimen contains approximately 6 g water. Experimental data processing includes obtaining the shape of natural line of QES law and its half-width as a function of scattering angle and temperature containing the data on the self-diffusion process in the liquid under investigation. Integral intensity of QES permits to estimate a mean square of molecule oscillation amplitude. The analysis of the shape of natural line of QES law permits to draw the conclusion, that within 300 to 600 K range the line has a shape close to Lorentzian. It proves that the effect of rotational component of self-diffusion is negligible. The presence of angular dependence of integral intensity of the QES law testifies to the elements of quasi-crystallinity in the microdynamic behaviour of water. Forces of intermolecular interaction in 300-600 K range change slightly. The contrubution of vibrational component to the total coefficient of self-diffusion does not exceed 5-7 %. (Atomindex citation 11:567926)

IAE-3259/12 PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Radiation of Charged Particles in the Field of a Point Dipole.
F. F. Baryshnikov, L. E. Zakharov, and V. S. Lisitsa. 1980, 36p
In Russian.
U.S. Sales Only.

Studied is the electron bremsstrahlung in the field of a point dipole, which size (d) is less than a critical value of 0.639 easub(0) corresponding to the absence of falling to a center. The bremsstrahlung radiation cross section dsigma/d omega is represented as in the known theory of radiation in the Zommerfeld coulomb field in the form of one-parametric frequency functions. Analytical solutions of radiation in the +- alpha r exp -2 potential are obtained along with numerical solutions in the -(dr)/r exp 3 potential. Studied are in detail some extreme cases: the Born case, the classical case, extreme cases of low and high radiation frequencies. Simple analytical approximations are achieved both for the dsigma/d omega spectrum and for the total radiation. (Atomindex citation 12:614447)

INP-1040/AP PC **A02**/MF **A01**
Institute of Nuclear Physics, Krakow (Poland).
Thermal Neutron Diffusion Parameters for Plexiglass.
K. Drozdowicz, A. Igielski, E. Krynicka-Drozdowicz, Z. Sobczynski, and U. Woznicka. 1979, 14p
U.S. Sales Only.

Thermal neutron diffusion and absorption parameters for plexiglass (methyl polymethacrylate resin) have been measured. The measurements have been performed in the spherical geometry using the pulsed method. The values obtained for the parameters are: <v sigma sub(a)>=4081+-41s exp -1 , D sub 0 =36365+-314cm exp 2 s exp -1 , C=4921+-1100cm exp 4 s exp -1 at the temperature of 23.5+-1.0 exp 0 C. They are in agreement with the data reported by other authors. The results of this work will be useful for preparing measurements on the two-component media. (Atomindex citation 12:576922)

ITEF-114(1980) PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Energy Losses by Charged Particles.
V. A. Soloshchenko. 1980, 28p
In Russian.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Studied are analytically energy losses of charged particles on ionization and excitation in a thin layer of gaseous substance. Derived are different representations of the kinetic equation total solution for the distribution function of energy losses. The results obtained are combined with the known theory of interaction of a charged particle with medium atoms. Revealed is the asymptotic conversion of formulae with the increasing layer thickness in the Landau distribution. The results of detailed calculations are presented along with their comparison with the experimental data. (Atomindex citation 12:614552)

JINR-R-1-80-341 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Space Development of Electron-Photon Showers Initiated by gamma Quanta with the Energy Esub(Gamma)=75-500 MeV.
B. Slovinskii, and V. Chai. 1980, 11p
In Russian.
U.S. Sales Only.

The results of measurements of ionization losses of shower electrons in electron-photon showers (EPS) initiated by gamma-quanta with the Esub(gamma)=75-500 MeV energy in liquid xenon are presented. Statistical analysis of experiments data has been performed and parametrization of space distribution of ionization losses of these showers has been obtained. It is established that transverse development of EPS does not depend on the longitudinal one. At the accuracy of the experiment achieved, the dependence of the EPS characteristic on the energy of shower electron cutting-off in the range of the energy threshold values for actual electromagnetic high-energy radiation detectors is not observed. A phenomenological description of EPS is suggested that is applicable to any homogeneous medium in the limits of the studied range of energy Esub. (Atomindex citation 12:603883)

JINR-R-3-80-398 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Calculation of Ultracold Neutron Pulsed Storage with Ferromagnetic Shutters.
M. I. Novopol'tsev, and Yu. N. Pokotilovskii. 1980, 13p
In Russian.
U.S. Sales Only.

The problem of the increase of ultracold neutron (UCN) density in traps at a pulsed thermal neutron source by using ferromagnetic shutters is discussed. Different versions of the UCN converters With a largely developed working area are considered. The results of UCN density gain factor calculation, two types of ferromagnetic shutters-double-sheet with current foil and one-sheet are given. For the latter case the depolarization rate of UCN in the storager due to the pulsed magnetic field which remagnetizes a ferromagnetic film has been calculated. The results indicate that ferromagnetic films with specific extremal properties are necessary for obtaining sufficiently high (about 30) gain factors. (Atomindex citation 12:603865)

JINR-R-4-80-103 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.

Localized Solutions of Electrodynamics Equations in Media with Anomalous Dispersion.
V. K. Ignatovich. 1980, 14p
In Russian.
U.S. Sales Only.

New types of proton localized state are considered. The first localization is due to the total reflection at any angle of incidence from a gas under the conditions of anomalous dispersion. The second - is the result of total reflection and strong electrostriction. The third - is the state described by wave packet, when the equation of motion for a proton transforms to the Klein-Gordon equation for a massive particle wave function. (Atomindex citation 12:602791)

NUREG/CR-2225 PC **A07**/MF **A01**
Rockwell International, Newbury Park, CA. Environmental Monitoring and Services Center.
An Unconstrained Overview of the Critical Elements in a Model State System for Emergency Response to Radiological Transportation Incidents.
Final rept. Jul 80-Apr 81,
F. C. Gunderloy, Jr., J. D. Moore, P. A. Scofield, and R. J. Tuttle. Dec 81, 131p
Sponsored in part by Municipal Environmental Research Lab., Edison, NJ.

The objective of the report is to present both descriptions and discussions on the critical elements that should be considered in developing a state program for responding to radiological transportation incidents. Each element is subjected to a thorough evaluation by assuming that it could be developed to its fullest and incorporated into a program without the everyday constraints of budget, time, or manpower. The effect is one of magnification, and the elements are thus scrutinized to an extent that might not otherwise be possible. The cost of the elements are also presented, either in terms of dollars or required manpower.

NUREG-0383-V3-REV-1 PC **A07**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Fuel Cycle and Material Safety.
Directory of Certificates of Compliance for Radioactive Materials Packages. Volume 3, Revision 1. Summary Report of NRC Approved Quality Assurance Programs for Radioactive Material Packages.
Dec 81, 140p
See also NUREG-0383-V3.

The directory contains a Summary Report of NRC approved Packages (Volume 1), Certificates of Compliance (Volume 2), and a Summary Report of NRC Approved Quality Assurance Programs for Radioactive Material Packages (Volume 3). The purpose of this directory is to make available a convenient source of information on packagings which have been approved by the U.S. Nuclear Regulatory Commission. To assist in identifying packaging, and index by Model Number and corresponding Certificate of Compliance number is included at the back of each volume of the directory. The Summary Report includes a listing of all users of each package design prior to the publication date of the directory.

RL-80-025 PC **A04**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Small Angle Neutron Scattering Analysis Programs on the Rutherford Laboratory IBM 360/195 Computers.
K. J. Knowles, and M. W. Johnson. Jun 80, 69p
U.S. Sales Only.

The implementation and operation of the suite of programs used for the analysis of small angle neutron scattering data originally written at the ILL (Grenoble) is described. The programs make use of a circulating data file which is also described and may be used by a variety of data analysis programs. (Atomindex citation 11:567928)

UM-P-80/37 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Imaging and Focusing of Neutrons by a Zone Plate.
P. D. Kearney, A. G. Klein, G. I. Opat, and R. Gahler. 1980, 10p
U.S. Sales Only.

The use of refractive lenses for long-wavelength neutrons, though possible, is severely limited by the fact that the refractive index differs only very slightly from unity. However, only a relatively thin layer of material is needed to produce an optical path difference of half a wavelength. This fact led the authors in 1978 to propose focusing by diffraction from a phase grating of variable spacing which is, in fact, a type of zone plate. They have been shown to work satisfactorily over a wide range of the electromagnetic spectrum, from microwaves, through visible light, and more recently soft x rays. Their use in focusing matter waves has not heretofore been demonstrated. (Atomindex citation 12:603869)

UM-P-81/1 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Neutron Propagation in Moving Matter: The Fizeau Experiment with Massive Particles.
A. G. Klein, G. I. Opat, A. Cimmino, A. Zeilinger, and W. Treimer. 1981, 11p
U.S. Sales Only.

Using a two-slit neutron interferometer, the authors have measured the shift of the interference pattern induced by the motion of a quartz rod. The measured shift is found to be in agreement with the quantum-mechanical prediction derived from a relativity argument. Some peculiarities of the case of massive particles as compared with the classic Fizeau photon case are discussed. (Atomindex citation 12:603870)

UM-P-81/14 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Focussing of Slow Neutrons with Cylindrical Zone Plates.
A. G. Klein, P. D. Kearney, G. I. Opat, and R. Gahler. 1981, 10p
U.S. Sales Only.

In an earlier paper the authors reported on the successful focusing and imaging of slow using a phase-shifting Fresnel zone plate. In applications where the source is in the form of a slit, much higher beam intensities may be obtained by using a cylindrical focusing structure. The construction and testing of a cylindrical zone plate with 2.5-m focal length for 20-A neutrons is presented. (Atomindex citation 12:603871)

UM-P-81/5 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Neutron Interference by Division of Wave Front.
A. G. Klein, P. D. Kearney, G. I. Opat, A. Cimmimo, and R. Gahler. 1981, 15p
U.S. Sales Only.

The highly successful perfect-crystal neutron interferometer of the type first developed by Bonse and Rauch exhibits interference by amplitude division. It relies on dynamical Bragg diffraction in a highly perfect single crystal to provide the beam splitting. This type of interferometer, topologically analogous to the Mach-Zehnder interferometer of classical optics, has been employed in a variety of interesting experiments using thermal neutrons. Its shortcomings, however, are its extreme sensitivity to mechanical and thermal disturbances, and its applicability only to wavelegths shorter than the Bragg cutoff (6.27 A in silicon). The authors discuss a novel type of neutron interferometer which was constructed and tested employing a split cylindrical zone plate with neutrons of 20-A wavelength. Its performance and relative merits are discussed. (Atomindex citation 12:603872)

18G. Radioactive Wastes and Fission Products

AD-A108 972/1 PC **A05**/MF **A01**
Analytic Sciences Corp., Reading, MA.
Recycling/Disposal Alternatives for Depleted Uranium Wastes.
Final rept. 12 Jun-12 Sep 80,
Sharon A. Bucci, James Y. Nalbandian, and David M. Kagan. Jan 81, 89p TASC-TR-3236, AFATL-TR-81-4, SBI-AD-E800 435
Contract F08635-80-C-0199

All depleted uranium (DU) waste generated during test activities and from unused war reserve is subject to disposal as low-level radioactive waste. At present there is no operational alternative to sending DU wastes to commercial disposal sites for burial. Because of the uncertainties associated with the use of commercial sites in the future, the Air Force is seeking to identify and evaluate feasible recycling/disposal alternatives for the disposition of its DU wastes. In this report, potential recycle and disposal options are defined and briefly characterized. For each form of the DU waste, benefits and issues of applicable recycling/disposal alternatives are identified. Based on a comparative evaluation of these options, the most promising mode(s) of disposition are indicated for each type of waste material. The responsibilities and key regulations of government agencies pertaining to the management of low-level radioactive waste are given in the appendix.

DE81032038 PC **A09**/MF **A01**
Oak Ridge National Lab., TN.
(Storage and Solidification of MAW/LAW in Underground Cavities). 3. Product Properties in the Operating Phase. Final Report.
K. J. Leers. 183p ORNL-tr-4761
Contract W-7405-ENG-26
D.

A simulated concentrate of medium-activity waste was used to produce a solidified product which would exhibit good, long-term stability and minimal leaching rates. The assessment included measurements of strengths, elastic moduli, porosity, mineral analysis, and leaching resistance. Among the types of cements used were: PZ 35 F and 55 F, furnace slag, iron Portland, deep-well, etc. Additives used to decrease leaching included ashes, sandstone, silica, etc. Best stability without additives was produced by Portland cement. Best additives were cement sealing agents based on vinyl propionate/vinyl chloride polymer, sodium silicate hydrate, and bentonite. Solids produced using blast-furnace slag cement were unstable. 155 figures, 20 tables. (ERA citation 06:034371)

NUREG/CR-2270 PC **A05**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Analysis of Nuclear Power Plant Systems Containing Radioactivity in a Core Damage Accident,
Wallis R. Cramond, and Robert G. Spulak. Oct 81, 78p SAND-80-2838

The objective of the study was to identify the systems that can potentially spread radioactivity in a core damage accident and, using importance measures relating to the potential hazard, rank these systems. Both the PWR and BWR are considered for both gaseous and liquid means of transport. The basic qualitative measures used are the likelihood of spreading radioactive material and the hazard to plant personnel and safety related equipment given spreading. The spreading measure is a function of a system's use in an accident and the interface that may permit flow of radioactivity. The hazard measure is a function of the size and extent of piping carrying the fluid, location in the plant, and dilution of the radioactive material transported from the reactor core. The results of the study is a set of matrices grouping the systems that are potential hazards. Ranking is structured to focus attention on the most significant systems.

NUREG/CR-2419 PC **A07**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Reference Repository Definition: Shale.
Final rept.,
E. D. McKay, F. A. Donath, F. W. Schwartz, D. W. Chorley, and A. S. Crowe. Nov 81, 149p SAND-81-7165
Prepared in cooperation with CGS, Inc., Urbana, IL. and Schwartz (F. W.) Ltd., Edmonton (Alberta).

Reference repository system (RRS) definition is an integral part of the ongoing U.S. Nuclear Regulatory Commission program to develop and refine the methodology for assessment of risk associated with disposal of high-level radio-active waste in deep, excavated cavities in geologic media. This report examines the geologic and hydrologic settings of three regions in North America as the basis for selection of one natural system to serve as a model for a reference repository system in shale (RRS-SH). In this RRS, shale is the candidate host medium for a high-level radioactive waste depository. The three regions studied are: (1) the Illinois Basin in Illinois, (2) the Williston Basin in South Dakota, and (3) the western Canada sedimentary basin in Alberta. For each region, the configuration of the geologic media, the properties of the media that affect waste isolation, and the ground-water flow

regime are described. These descriptions are used to evaluate the suitability of each system as a basis for RRS definition and to document the process by which the RRS was selected.

PB82-902900 Subscription
Department of Energy, Oak Ridge, TN. Technical Information Center.
Radioactive Waste Management.
Biweekly repts.
1982, 26 issues
Supersedes PB81-902900.
Paper copy available on subscription, North American Continent price $40.00/year; all others write for quote.

Management of radioactive wastes is necessary to protect public health, public safety, and the environment from radioactive materials resulting from national defense programs, energy research and development, and commercial activities. Access to information on the critical topics of spent fuel transport and storage, radioactive effluents from nuclear facilities, techniques of processing radioactive wastes, and ultimate disposal of the wastes as well as transport and shipping containers is provided by this publication. Information on remedial actions and other environmental aspects is also included. The subject index refers to summaries by sequence numbers. The summaries refer to scientific and technical reports, journal articles, books, patents, theses, conference papers, and monographs from all sources on radioactive wastes. A report number index shows the availability and distribution of the reports included. Quarterly cumulative personal author, corporate author, subject, report number, and contract number indexes are provided.

18H. Radioactivity

PB82-140443 PC **A07**/MF **A01**
Conference of Radiation Control Program Directors, Inc., Rockville, MD.
Natural Radioactivity Contamination Problems.
Rept. no. 2. (Final).
Sep 81, 134p NCRCPD-1
Prepared in cooperation with Nuclear Regulatory Commission, Washington, DC, and Department of Health and Human Services, Washington, DC. Bureau of Radiological Health. See also PB-281041.

Levels of naturally occurring radionuclides associated with the bauxite, columbium-tantalum, phosphate, tin, pumice, and titanium mineral extraction industries are reported. Data is also presented on radioactivity measurements in ground water, in selected geothermal waters, and in oil production brines. Radiation protection guidance is provided for uranium recovery from wet-process phosphate plants, for soil contamination limits, and for radiological exposure in natural caves. Dose pathways from incidental uses of naturally occurring radioactive materials are presented. Model state regulations for protecting public health and safety from use and disposal of naturally occurring radioactive material are outlined.

18I. Reactor Engineering and Operation

NUREG/CR-1998-SUP-N1
PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
RELAP4/MOD7 - A Best Estimate Computer Program to Calculate Thermal and Hydraulic Phenomena in a Nuclear Reactor or Related System, Supplement 1,
Steven R. Behling, Ming T. Hsu, Charles A. Dobbe, and Stewart R. Fischer. Nov 81, 28p EGG-2089-SUPPL-1
Contract DE-AC07-76IDO1570
Supplement to NUREG/CR-1998.

This supplement consists of new sections to the original Document EGG-2089. They are numbered for appropriate insertion into the original text.

NUREG/CR-2058 PC **A04**/MF **A01**
Creare, Inc., Hanover, NH.
Summary of Refill Effects Studies with Flashing and ECC Interactions,
Christopher J. Crowley. Nov 81, 59p CREARE-TN-329

The report summarizes the results of an experimental and analytical program which has modeled blowdown and refill in scale model PWRs in a more realistic and continuous manner than previous separate effects experiments in the Creare program. These experiments are intended to complement and conribute to a fuller understanding of integral experiments such as LOFT. Experiments have been performed at 1/30, 1/15, and 1/5-scale vessel sizes. The latter is approximately LOFT scale. An independent analysis was developed to explore various modeling options for the phenomena observed in the experiments and to identify the most important phenomena to model. Bounding and sensitivity calculations were also performed. Finally, a RELAP4 code (MOD7) was used to demonstrate that best-estimate calculations can be performed continuously through refill and to calculate refill behavior.

NUREG/CR-2085 PC **A06**/MF **A01**
Creare, Inc., Hanover, NH.
RELAP4/MOD7 Analysis of Flashing Transient Effects During Refill.
Topical rept.,
Christopher J. Crowley. Nov 81, 115p CREARE-TN-328

The report compares RELAP4/MOD7 computer code calculations against 23 Creare flashing transient tests. The data simulate blowdown and refill in 1/5 and 1/15 scale model PWR vessels, both with ahd without ECC injection. The RELAP4/MOD7 models for phase separation, downcomer momentum exchange, and condensation (equilibrium and non-equilibrium) are studied in the context of these data. Recommendations for the Wilson slip correlation, a modified void fraction calculation for downcomer slip (based on junction void fraction), and non-equilibrium condensation are made. The modified void fraction model has been developed and implemented in the code as part of this project. Comparisons demonstrate that continuous best-estimate calculations can be performed with RELAP4/MOD7 from blowdown through refill, as shown by good comparisons with vessel pressure, liquid inventory, plenum void fraction, and fluid temperature measurements from the experiments.

NUREG/CR-2154 PC **A05**/MF **A01**
Michigan Univ., Ann Arbor. Dept. of Electrical and Computer Engineering.
Ultrasonic Imaging Techniques for Real-Time In-Service Inspection of Nuclear Power Reactors.
Progress rept. Oct 79-Dec 80,
S. Ganapathy, N. Hamano, M. R. Betker, W. S. Wu, and T. G. Dennehy. Oct 81, 86p
Color illustrations reproduced in black and white.

Progress in the development of a real-time system for in-serivce inspection of reactor vessels and piping components is described in this report. A thorough analysis of the processing bottlenecks in the synthetic Aperture Focusing Techniques is presented along with some possible solutions to achieve increased processing speed. Techniques have been designed and implemented for improved display of flaw images and results of this study are presented. The progress includes development of techniques to recognize flaws near the front surface of the object under inspection and development of squint-mode scanning and processing methods.

NUREG/CR-2307 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Monte Carlo Analysis of LWR Steam Explosions,
Daniel V. Swenson, and Michael L. Corradini. Oct 81, 72p SAND-81-1092

In this report, the authors present a probabilistic assessment of containment failure due to an in-vessel steam explosion following a core melt accident in a Light Water Reactor. We limit our assumptions to the most basic physical parameters of the core melt accident in a Light Water Reactor. Assumptions are limited to the most basic physical parameters of the core melt accident and these parameters are described with frequency distributions. A Monte Carlo solution technique is used to calculate output frequency distributions for steam explosion energy, reactor vessel response, and resulting missile velocities. Based on these results, we estimate the probability of containment failure due solely to an in-vessel steam explosion to be one to two orders of magnitude smaller than the probability used in the Reactor Safety Study (WASH-1400).

NUREG/CR-2406 PC **A07**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
A Survey of Experimentally Determined Damping Values in Nuclear Power Plant Piping Systems,
Arthur G. Ware. Nov 81, 141p EGG-2143
Contract DE-AC07-76IDO1570

This report presents results of recent experimental investigations of damping in nuclear power plant piping systems. The primary data source was tests conducted at the Heissdampfreaktor in Germany. Damping was shown to be a strong function of the type of piping supports, and also a function of response frequency and excitation source magnitude. Curve fits of damping vs. response frequency suitable for use in structural computer codes were calculated.

NUREG/CR-2451 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
Behavioral Model for Reinforced Concrete Panels Under Cyclic Shear.
Technical rept.,
Tsi-Ming Tseng, J. Calvo, O. Buyukozturk, and J. Conner. Dec 81, 110p

In the first part of this report recent models of shear transfer across continuous cracks penetrating through the thickness of reinforced concrete specimens under monotonic loading are briefly reviewed. The models proposed by Leombruni and Jimenez are applied to the tests conducted by the Portland Cement Association (PCA). In the second part of this report a numerical model is developed to predict the behavior of orthogonally reinforced concrete wall panels subjected to the combined action of tension and cyclic shear. The model is based on the experimental results obtained by PCA in the testing of the RB5 and RB6 specimens. The applicability of the model is verified by comparing the predicted results with those obtained from the recent tests by Cornell University. The proposed model shows excellent agreement with the experimental results. The applicability of this cyclic shear model to the analysis and design of nuclear containment structures is discussed.

NUREG/CR-2454 PC **E03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Experiment Data Report for Semiscale Mod-2A Natural Circulation Tests S-NC-2B, S-NC-3, and S-NC-4B,
Thomas M. O'Connell. Jan 82, 75p EGG-2141
Included two sheets of 48X reduction microfiche.

This report presents recorded test data for Tests S-NC-2B, and S-NC-4B of the Semiscale Mod-2A Natural Circulation Test Series. These are part of a series of Semiscale tests that investigates the thermal-hydraulic phenomena resulting from operational transients or small break loss-of-coolant accidents (LOCA) involving the loss of mechanical primary coolant circulation in a pressurized water reactor (PWR). These tests produce experimental data to develop and assess the analytical capability of computer models used to predict the results of small break LOCAs and operational transients involving the loss of primary pumping ability. Test S-NC-2B was a baseline natural circulation test involving singlephase, two-phase, and reflux modes of natural circulation. The test investigated the relationships of primary system mass inventory and core power with the various modes of, natural circulation test which investigated the effect of various steam generator secondary side hydraulic conditions on the natural circulation flow rate, with constant core power and primary mass inventory. Test S-NC-4B was a reflux natural circulation test which investigated the effect of steam generator secondary side liquid inventory on the natural circulation flow rate and on other primary system conditions.

NUREG-0831-SUP-N1 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Operation of Grand Gulf Nuclear Station, Units 1 and 2, Docket Nos. 50-416 and 50-417, Mississippi Power and Light Company, Middle South Energy, Inc., South Mississippi Electric Power Association; Supplement Number 1.
Safety evaluation rept.
Dec 81, 61p

Supplement to NUREG-0831.

Supplement No. 1 to the Safety Evaluation Report on the application filed by Mississippi Power & Light Company, et al, for licenses to operate the Grand Gulf Nuclear Station, Units 1 and 2, located on the east bank of the Mississippi River near Port Gibson, in Claiborne County, Mississippi, has been prepared by the Office of Nuclear Reactor Regulation of the U. S. Nuclear Regulatory Commission. This supplement reports the status of certain items that had not been resolved at the time of publication of the Safety Evaluation Report.

18J. Reactor Materials

NUREG/CR-2140 PC **A05**/MF **A01**
Sandia National Labs., Albuquerque, NM.
The CAIS Fuel Motion Detection System - Development, System Design and Proof Tests,
John G. Kelly, and K. Terry Stalker. Sep 81, 85p SAND-81-1112

The report describes the principles of operation, the system design and the proof tests of the Coded Aperture Imaging System (CAIS) which has been designed to measure fuel motion in simulated reactor accident tests conducted in the Annular Core Research Reactor. The proof tests have demonstrated that the system can be inserted and accurately aligned in the core and that high resolution, high speed pictures of fuel motion can be obtained. In addition, the tests have permitted quantification of the present performance limits and have revealed a number of direct avenues for significant improvements.

NUREG/CR-2216 PC **A04**/MF **A01**
Brookhaven National Lab., Upton, NY.
Institutional Issues Associated with Spent Fuel Storage Under Domestic and International Auspices,
John N. O'Brien. Sep 81, 65p BNL-NUREG-51413
Contract DE-AC02-76CH00016

The report examines the various institutional issues associated with the establishment of away-from-reactor (AFR) spent fuel storage. Technical factors contributing to the problem of spent fuel congestion are briefly reviewed and differing projections of capacity shortfalls are discussed. Chapter II analyzes the institutional considerations pertinent to the establishment of a domestically constructed and operated AFR facility. This chapter discusses facility characteristics, federal agency jurisdictions, the state/federal interface, and financial arrangements. Chapter III discusses the problems associated with establishment of an AFR storage facility under international auspices. Also discussed are international auspices, appropriate compensation for energy content, and sovereign immunity. A comprehensive description of the organization and structure of international organizations is presented. Recommendations are made for the organization and structure of an international AFR.

NUREG/CR-2217 PC **A04**/MF **A01**
Brookhaven National Lab., Upton, NY.
Detection of Special Nuclear Materials at Portal Monitors and Location and Recovery of Contraband Special Nuclear Materials: Legal and Technical Problems,
John N. O'Brien. Sep 81, 55p BNL-NUREG-51414
Contract DE-AC02-76CH00016

The report examines the issues of how reliably special nuclear materials (SNM) can be detected during attempts to steal it and how recovery techniques initiated because of a confirmed theft may affect civil liberties. Chapter II addresses the technical abilities and limitatins of detecting SNM under both controlled and uncontrolled conditions. The concepts of 'spiking' and shielding are examined. Chapter III discusses the legal requirements and technical limits on detecting small quantities of SNM during smuggling attempts. Assessments are made concerning the type of detectors most desirable and which forms of SNM could logically be spiked to enhance their detectability. Administrative and legal restrictions on portal searches and emergency site responses to SNM losses are comprehensively examined. Chapter IV examines the activity of searching for and recovering contraband SNM. Methods for searching, sources of difficulty, and estimates of sensitivity are made. The legal implications of area and perimeter searches are examined with particular regard to problems of search and seizure law.

NUREG/CR-2236-V1 PC **A04**/MF **A01**
Science Applications, Inc., Oak Ridge, TN.
Seismic Resistance Capacity Evaluation of Spent Fuel Storage Racks and Fuel at West Valley, New York. Main Report.
Technical rept.,
N. E. Johnson, and J. C. Walls. Dec 81, 74p SAI-148-026-V1
See also NUREG/CR-2236-V2.

This report documents an evaluation of the seismic resistance capacity of the Fuel Receiving Station (FRS) spent fuel storage racks and canisters at the Nuclear Fuel Services Reprocessing Plant at West Valley, New York. The primary objective of this work was to determine the threshold ground acceleration above which potential yielding, permanent deformation or collapse, and/or excessive deformations would occur to the storage rack structure and canisters. Examination of the failure threshold levels show that the splice joint in the top rail of the storage rack will be the first item to reach yield stress. This even occurs at 0.19g. The results also show that the top rail splice joint would probably be the first component to break at a threshold of 0.22g. A probable scenario of events following the top rail splice joint failure is that loads will redistribute in the storage rack causing the anchor bolts connecting the rack columns to the pool floor to fail. This will subsequently cause the rack to deflect in an East-West direction until it impacts the pool wall or another rack. Although this event could cause a few canisters to become dislodged from the rack and fall to the pool floor causing crushing of the canisters, such an occurrence is considered to be unlikely.

NUREG/CR-2236-V2 PC **A20**/MF **A01**
Science Applications, Inc., Oak Ridge, TN.
Seismic Resistance Capacity Evaluation of Spent Fuel Storage Racks and Fuel at West Valley, New York. Appendices.
Technical rept.,
N. E. Johnson, and J. C. Walls. Dec 81, 460p SAI-148-026-V2
See also NUREG/CR-2236-V1.

This report documents an evaluation of the seismic resistance capacity of the Fuel Receiving Station (FRS) spent fuel storage racks and canisters at the Nuclear Fuel Services Reprocessing Plant at West Valley, New York. The primary objective of this work was to determine the threshold ground acceleration above which potential yielding, permanent deformation or collapse, and/or excessive deformations would occur to the storage rack structure and canisters. Examination of the failure threshold levels show that the splice joint in the top rail of the storage rack will be the first item to reach yield stress. This event occurs at 0.19g. The results also show that the top ral splice joint would probably be the first component to break at a threshold of 0.22g. A probable scenario of events following the top rail splice joint failure is that loads will redistribute in the storage rack causing the anchor bolts connecting the rack columns to the pool floor to fail. This will subsequently cause the rack to deflect in an East-West direction until it impacts the pool wall or another rack. Although this event could cause a few canisters to become dislodged from the rack and fall to the pool floor causing crushing of the canisters, such an occurrence is considered to be unlikely. Volume 1 contains the text of the report and Volume 2 includes appendices containing technical supporting data generated during the preparation of the report.

NUREG-0866 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Fuel Cycle and Material Safety.
The Effects of Natural Phenomena on the General Electric Company Vallecitos Nuclear Center at Pleasanton, California, Docket No. 70-754.
Nov 81, 59p

The analysis is in support of the Special Nuclear materials License held by the subject company. It addresses the probable effects of damage to the General Electric Plant by severe weather and earthquake and expresses the consequences of damage as dose to several human receptors. The doses that result from facility damage are multiplied by the occurrence rate for the initiating event yielding the yearly risk.

19.

ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

PB82-862517 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aluminized Propellants and Explosives. 1970-February, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Feb 82.
Feb 82, 127p
Supersedes PB80-808561.

This bibliography cites reports on the design, manufacture and use of aluminized propellants and explosives. Subject matter includes test data on the performance and combustion stability, plus investigations of safety and aging of the explosives and propellants. Also covered are production processes and casting techniques. This bibliography contains some reports for which the previous distribution limitation has been removed. (This updated bibliography contains 93 citations, 36 of which are new entries to the previous edition.)

19C. Combat Vehicles

AD-A109 128/9 PC **A04**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
Technical Application and Feasibility Assessment of Scroll Compressor/Expander for Air Cycle Cooling of Combat Vehicles.
Final rept. Jul-Oct 81,
John E. McCullough, and John T. Dieckmann. Nov 81, 66p Rept no. ADL-C-86780-01
Contract DAAK70-79-D-0036

An air cycle cooling system utilizing a Scroll compressor and expander was sized and its performance estimated. The design produced appears to have advantages and merits further investigation relative to practicality and verification of performance projections. (Author)

AD-A109 168/5 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
Large-Scale Production of the M1 Tank should be Delayed until its Power Train is Made More Durable.
15 Dec 81, 26p Rept no. GAO/MASAD-82-7
Report to the Congress.

The Army has requested funds to procure 720 M1 tanks in fiscal year 1982. Although the tank has met virtually all of its major combat requirements, the tank's power train durability must be improved so that the tank's performance can measure up to its full potential. Until this is done, it would be unwise to produce the M1 in large numbers. To do so would merely increase the inventory of tanks hampered by engines requiring frequent replacement and costly maintenance. Other tank components also required frequent maintenance during testing. Whether this was generally a correctable problem of poor quality control at contractor plants, as the Army contends, or whether it will become a chronic problem remains to be seen. (Author)

AD-A109 407/7 PC **A07**/MF **A01**
Human Resources Research Organization, Alexandria, VA.
Training for the Infantry Fighting Vehicle-M2: An Evaluation of the 11M10 Course.
Special rept. May-Oct 81,

Roy C. Campbell, and William C. Osborn. 30 Oct 81, 131p HUMRRO-SR-MTRD(KY)-81-17, TDI-TR-2-81

The Infantry Fighting Vehicle-M2 is scheduled for introduction into the inventory during FY 1982. The U.S. Army Infantry School prepared a three week add n course to 11B OSUT to qualify IFV crewmen as 11M10. This course required validation prior to implementation. The validation method used involved on site observation involving Training Program Evaluation (TPE) of two course tryouts. Separate reviews of the Lesson Outlines and course tests were performed. The proposed course was found to meet the objectives of 11M training but seven major recommendations for course improvement were made. Numerous observations and suggestions on conduct of training, Lesson Outlines and Testing are included.

19D. Explosions, Ballistics, and Armor

AD-A108 775/8 PC **A11**/MF **A01**
Naval Surface Weapons Center, Dahlgren, VA.
Fragment Hazard Investigation Program: Natural Communication Detonation of 155-mm Projectiles.
Final rept.,
J. G. Powell, W. D. Smith, and F. McCleskey. Jul 81, 226p Rept no. NSWC/TR-81-54

This report presents the experimental findings from the detonation by means of natural communication of Army M107 155-mm projectiles (TNT-loaded) stacked in various storage configurations. Projectile stacks ranging from one to 36 pallets were detonated. The ultimate goal of the program is to provide a methodology for the determination of quantity-distance safety standards for the safe and efficient storage of explosive-filled fragment producing munitions. In order to simplify the problem, various projectile stacks based on the standard storage pallet were detonated by means of natural communication in a series of small-scale (one pallet) fragmentation arena tests and large-scale (multiple pallet) tests designed for far-field fragment collection. A description of each test is discussed, and an analysis of the data is presented. A fragmentation model characterizing the detonation by means of natural communication of a pallet of 155-mm projectiles is presented and verified. From this model, a methodology was developed for the determination of far-field fragment hazards produced from the detonation by means of natural communication of open storage stacks of 155-mm projectiles. The significance of the methodology indicates that the quantity-distance standards for large stacks of ammunition can be determined from less expensive, less complex small-scale fragmentation arena tests. (Author)

AD-A108 926/7 PC **A02**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
Comments on the Doubly Asymptotic Approximation. II. A Simple Approximation for Cutoff Velocity.
Final rept. Jan-Jun 81,
David W. Nicholson, and Martin H. Marcus. 15 Sep 81, 14p Rept no. NSWC/TR-81-329-2

A model problem is used to examine the error of a simple approximation, obviating the calculation of relief pressures used in the Doubly Asymptotic Approximation. The error is a function of a quantity which may be interpreted as the ratio of structural response times to fluid pressure decay times. The greatest relative error is about 27% and usually is somewhat less, suggesting the use of a simple 'correction factor' for cutoff velocity. (Author)

AD-A108 989/5 PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
Cratering Capabilities of Low-Yield Nuclear Weapons.
Final rept.,
John N. Strange. Jul 81, 32p Rept no. WES/MP/SL-81-18

A review of past cratering experiments, both from high explosives and nuclear explosives, was conducted and the data gathered were analyzed in order to develop a generalized empirical method for predicting crater dimensions when only qualitative information on the media cratered is available. The methods developed enable crater predictions to be made in homogeneous and layered media within the stated orders of scatter. It is believed that the probability of a given crater falling within the predicted values is in the range of 0.8. (Author)

19E. Fire Control and Bombing Systems

AD-A109 006/7 PC **A02**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Evaluation of the Position and Azimuth Determining System's Potential for Higher Accuracy Survey,
Thomas O. Tindall. 20 Mar 82, 13p Rept no. ETL-R029

This paper reports on tests conducted to evaluate the accuracy potential of the U.S. Army Field Artillery's inertial survey system (Position and Azimuth Determining System AN/USQ-70). The tests were conducted by researchers at the U.S. Army Engineer Topographic Laboratories starting in the summer 1981. The test results reported include position, height and gravity anomaly. Also discussed is a post-mission least squares adjustment technique which was applied to the test results and which should have application to other inertial survey system missions. The Position and Azimuth Determining System (PADS) is a self-contained surveying system which provides fourth- and fifth-order control for U.S. Army Artillery surveys. The PADS is essentially a velocity aided inertial navigation system which has been designed to provide positional accuracy to 20 meters circular error probable (CEP) and height accuracy to 10 meters probable error (PE) over a 6-hour mission which starts at a 'known' survey control point.

19F. Guns

AD-A109 081/0 PC **A02**/MF **A01**
Army Materials and Mechanics Research Center, Watertown, MA.
Stress Intensity and Fatigue Crack Growth in Multiply-Cracked, Pressurized, Partially Autofrettaged Thick Cylinders.
Final rept.,
Anthony P. Parker. Aug 81, 20p Rept no. AMMRC-TR-81-37

Stress intensity factors are determined for internally and externally cracked, pressurized thick cylinders with partial autofrettage (less than 100% overstrain). The solutions are based on a superposition of existing solutions which does not involve any loss of accuracy. Implications of the stress intensity factor results for the safe-life design of gun tubes are discussed. Various suggestions for future work are presented. (Author)

AD-A109 320/2 PC **A03**/MF **A01**
Army Armament Research and Development Command, Watervliet, NY. Large Caliber Weapon Systems Lab.
Thermo-Elastic-Plastic Stresses in Multi-Layered Cylinders.
Technical rept.,
John D. Vasilakis. Nov 81, 32p Rept no. ARLCB-TR-81044
Presented at the 27th Conference of Army Mathematicians, US Military Academy, 10-12 Jun 81, West Point, NY.

One of the many efforts undertaken to increase the life of gun tubes and/or increase their resistance to erosion involves the use of linears fabricated from different materials. A finite difference computer code for investigating the thermo-elastic-plastic response of gun tubes has been expanded to include multi-layered cylinder response to time dependent boundary conditions. Considered are both cyclic heat input and cyclic stress input. Response curves from inputs representative of repeated firing cycles are presented. The emphasis in this report is on the transient temperature response and on the thermo-elastic stresses and mechanical stresses in the layers. (Author)

19H. Underwater Ordnance

AD-A108 816/0 PC **A04**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Ship Performance Dept.
Experimental Determination of Unsteady Forces on Contrarotating Propellers for Application to Torpedoes.
Final rept.,
Marlin L. Miller. Dec 81, 52p Rept no. DTNSRDC/SPD-0659-02

This report presents results of measurements of unsteady forces and moments on 4x4 and 4x5 bladed sets of contrarotating propellers in uniform flow and in a 4-cycle wake for application to torpedo propeller design. The uniform flow measurements were made to check earlier results that had been in disagreement with the results from calculations based on propeller theory. The uniform flow results confirmed the earlier results in showing larger forces on the forward propeller which is contrary to the prediction of existing theory. The results of the experiments in the 4-cycle wake showed unsteady forces on the forward propeller due to the effect of the wake along with the interaction forces between the two propellers. No theoretical calculations are available for comparison with the wake results. The present procedure for conducting unsteady force and moment measurements on contrarotating propellers continues to be tedious and easily subject to error. Consequently, it is recommended that no further experiments be conducted using this procedure. It is recommended that for future experiments on contrarotating propellers the shafts be locked together mechanically and that a second dynamometer be used so that unsteady measurements can be made on both propellers simultaneously. (Author)

20. PHYSICS

20A. Acoustics

AD-A108 814/5 PC **A04**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
Acoustic Measurements of F100-PW-100 Engine Operating in Hush House NSN 4920-02-070-2721.
Final rept. May-Sep 81,
Vincent R. Miller, G. A. Plzak, and J. M. Chinn. Sep 81, 58p Rept no. AFWAL-TM-81-133-FIBE

The purpose of this test program was to measure the acoustic environment in the hush house facility located at Kelly AFB Texas during operation of the F100-PW-100 engine to ensure that engine structural acoustic design limits were not exceeded. The acoustic measurements showed that no sonic fatigue problems are anticipated with the F100-PW-100 engine structure during operation in the hush house. The measured acoustic levels were less than those measured in an existing F100-PW-100 engine wet-cooled noise suppressor, but were increased over that measured during operation on an open test stand. It was recommended that the acoustic load increases measured in this program should be specified in the structural design criteria for engines which will be subjected to hush house operation or defining requirements for associated equipment. (Author)

AD-A108 836/8 PC **A03**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
A Finite Element Method for Computing Sound Propagation in Ducts Containing Flow.
Final technical rept. Dec 75-May 81,
Dennis W. Quinn. Sep 81, 31p Rept no. AFWAL-TR-81-3087

In this report, solutions of the equations which describe sound propagation in nonuniform ducts contain-

ing flow are computed with a finite element approach. A least squares approach is considered and compared to a Galerkin approach. The least squares problem is solved using an iterative method and compared with results obtained using direct Gaussian elimination. The accuracy of linear basis functions on triangles, bilinear basis functions on rectangles, and biquadratic basis functions on rectangles are compared. For the nonuniform ducts, the use of quadriilaterals as elements and an isoparametric map are considered. The biquadratics permit good approximation of curved boundaries and better convergence than the bilinear basis functions. Consequently, the finite element solution space consists of piecewise biquadratics defined on the finite element discretization of the geometry of the duct. Acoustic fields within uniform ducts both with and without flow have been computed and compare well with modal solutions and finite difference solutions. For nonuniform ducts without flow, the computed acoustic fields also compare well with exact or other computed solutions. For the case of two-dimensional flow within nonuniform ducts, sample calculations favorably compare with other solutions or limiting cases. (AUTHOR)

AD-A109 028/1 PC **A04**/MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA.
Investigation of Shallow Bulk Acoustic Waves.
Final rept. 1 Oct 78-19 Sep 81,
K. H. Yen, R. S. Kagiwada, K. F. Lau, and R. B. Stokes. 12 Nov 81, 53p ARO-15367.7-EL
Contract DAAG26-78-C-0043

This final report summarizes the most important results of the Investigation of Shallow Bulk Acoustic Waves (SBAW) program. This program was conceived on the principle that SBAW technology could lead to devices that are superior to those presently available for frequency filtering and control. The primary objective was to establish whether this technology could provide devices that were as stable as the low frequency bulk wave resonators and yet operate at frequencies higher than the surface acoustic wave devices. The investigations have shown that SBAW devices can be built with excellent temperature stability, low spurious modes and at frequencies higher than those of SAW devices and bulk wave resonators.

AD-A109 420/0 Not available NTIS
SACLANT ASW Research Centre, La Spezia (Italy).
Low-Frequency Ambient Noise in the Deep Sound Channel - The Missing Component,
Ronald A. Wagstaff. 23 Jun 80, 9p Rept no. SACLANTCEN-SR-51
Availability: Pub. in Jnl. of the Acoustical Society of America, v69 p1009-1014 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 424/2 Not available NTIS
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Multiple Scattering of Acoustic Waves by Random Distributions of Discrete Scatterers with the Use of Quasicrystalline-Coherent Potential Approximation,
L. Tsang, and J. A. Kong. 18 Aug 80, 12p ARO-15653.61-EL
Contract DAAG29-78-C-0020
Prepared in cooperation with Texas A and M Univ., College Station. Dept. of Electrical Engineering and Remote Sensing Center.
Availability: Pub. in Jnl. of Applied Physics, v52 n9 p5448-5458 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-803925 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Maneuvering Aircraft: Noise Pollution and Control. 1976-1981 (Citations from the NTIS Data Base).
Jan 82, 213p
Supersedes PB80-815566, and NTIS/PS-79/0973.

Methods for alleviating noise created by maneuvering aircraft are cited. Flyby, turning flight, takeoffs, and landings are the maneuvers investigated. (This updted bibliography contains 206 citations, 22 of which are new entries to the previous edition.)

20B. Crystallography

AD-A108 919/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Transition Temperatures and Heats of Crystallization of Amorphous Ge, Si, and Ge(1-x)Si(x) Alloys Determined by Scanning Calorimetry.
Journal article,
John C. Fan, and Carl H. Anderson, Jr. 24 Sep 80, 5p JA-5152, ESD-TR-81-319
Contract F19628-80-C-0002
Pub. in Jnl. of Applied Physics, v52 n6 p4003-4006 Jun 81.

No abstract available.

AD-A109 052/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Francis Bitter National Magnet Lab.
Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.
Annual interim rept. 1 Aug 80-31 Jul 81,
Kenneth J. Button, and M. N. Afsar. 14 Oct 81, 17p
AFOSR-TR-81-0849
Grant AFOSR-78-3708

An ultimate method for the unambiguous identification of donors in epitaxial GaAs and related compounds has been devised and demonstrated. A specimen is grown by means of the molecular beam epitaxy technique and is lightly doped with a single donor element during growth so as to render the specimen n-type. The far infrared photoconductivity method of spectroscopy is used to determine the energy difference between the electron ground state and the next higher excited state (2p, m = -1) at low temperature and in high intensity magnetic fields. A 'signature curve' of energy vs. magnetic field intensity is generated for various values of applied magnetic field intensity. Thereafter, any time that this particular element is present as a residual donor in any other specimen, a single measurement at any field will yield a point which must lie on the signature curve of the particular donor element. By this means any residual donor can be identified without ambiguity. We have generated and published signature curves for Sn, Se, Si, Ge and sulfur. (Author)

AD-A109 305/3 PC **A02**/MF **A01**
Michigan Univ., Ann Arbor. Electron Physics Lab.
Electrical Compensation in InP Produced by Background Impurities and Structural Defects.
Final rept.,
B. L. Mattes. Oct 80, 25p
Contract N00019-80-C-0045

A steady-state liquid phase epitaxial growth system is being used to study the factors that influence the nucleation, growth and purity of InP. Humidity (>30% relative) has been found to be a major contaminant that leads to erratic growth morphologies and poor electrical properties. With the growth system and substrate preparations in a low humidity (<20% relative) room the reproducibility of epitaxial growths has been improved. The discoloration of the bone white pyrolytic boron nitride growth cell has helped to identify several sources of contamination that oxidize the In-melt and lead to premature nucleation. The nucleation and growth of epitaxial InP now appears to be limited by phosphorus transport instabilities in the P-saturated In-melt. A thermochemical analysis of phosphorus equilibria with In and InP may provide an insight into liquid solid stability conditions. The results are in excellent agreement with the stability of the In-P liquidus curve and InP substrates under PH3-H2 mixtures. The analysis appears to indicate that the partial pressure of P4 controls the nucleation of InP and the stability of the In-P liquidus curve. At temperatures below 700 deg C the partial pressure of P2 is greater than that for P4 and appears to stabilize the InP substrate degradation. (Author)

AD-A109 358/2 Not available NTIS
Nebraska Univ. at Omaha. Dept. of Physics.
Theoretical Study of the Structural Phase Transition in RbCaF3,
L. L. Boyer, and J. R. Hardy. 18 May 81, 16p ARO-16620.3-P
Contract DAAG29-80-C-0034
Availability: Pub. in Physical Review B, v24 n5 p2577-2591 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14938/6 PC **A03**/MF **A01**
Helsinki Univ. of Technology, Otaniemi (Finland).
Studies of Vacancy: Type Defects in Metals.
Ph.D. Thesis.
J. Johansson. 1981, 27p
Sponsored in Part by the Jenny and Antti Wihuri Foundation, the Eemil Aaltonen Foundation, the Finnish Cultural Foundation, Cnrs and Actim.

The positron annihilation technique was applied in studying the elementary properties of vacancies, vacancy interaction with impurities and vacancy clustering in metals on such an atomic scale that these phenomena are not detectable in the electron microscope. The vacancy migration temperature and some features of the vacancy-carbon interaction in iron, the vacancy properties and behavior of irradiated silver, the annealing behavior of electron irradiated chromium, and the quenched-in, irradiation induced and thermal vacancies in magnesium are considered.

N82-14939/4 PC **A09**/MF **A01**
Katholieke Univ. Nijmegen (Netherlands).
Kinetics Studies on the Nucleation and Growth of Silicon Via Chemical Vapour Deposition.
Ph.D. Thesis.
W. A. P. Claassen. 27 Feb 81, 178p

The grain size in polycrystalline silicon layers is subject to various external conditions among which the initial nucleation of silicon on the substrate may play a decisive role. This article describes experiments with silicon on SiO2 and Si3N4 substrates in the SiH4-HCl-H2 system for temperatures between 925 and 1200 C. The saturation cluster densities are determined as a function of gas phase composition and temperature and could be varied between 10 to the fourth power - 10 to the eleventh power per sq cm. The experimental results are compared with predictions of existing nucleation theories using analysis of the monomer silicon adatom concentration. In this way the nucleation can be described satisfactorily and approximate values for the size of the critical cluster can be derived.

N82-14948/5 PC **A03**/MF **A01**
Wacker-Chemie G.m.b.H., Burghausen (Germany, F.R.).
Research and Development on Technologies for the Preparation of III-V Semiconductor Materials and on Methods for Evaluation of the Quality of These Materials: Production of Gallium Phosphide Crystals.
Final Report.
M. Blaette. Mar 81, 28p BMFT-FB-T-81-021, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technol.

Methods for economic synthesis and crystal growth of gallium phosphide were developed. Polycrystalline ingots up to 800 gr of the dense and homogeneous quality necessary for crystal growth are currently produced with very good yield. The conditions for high pressure crystal growth by the liquid encapsulation technique were thoroughly investigated and optimized in a manner that permits industrial production of substrate quality crystals with a weight of 700 grams and a diameter of 50 mm. Diameter variations, common in the growth of GaP crystals, can be reduced to a few millimeters by a monitoring system based on crystal weighing.

N82-14949/3 PC **A03**/MF **A01**
Wacker-Chemie G.m.b.H., Burghausen (Germany, F.R.).
Research and Development on Technologies for the Preparation of III-V Semiconductor Materials and on Methods for Evaluation of the Quality of These Materials: Gallium Arsenide Crystals, Crucible Pulling of Ga as Crystals.
Final Report.
M. Blaette. Jan 81, 38p BMFT-FB-T-81-022, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The economic synthesis of the polycrystalline starting material was investigated. For the industrial production of gallium arsenide crystals, which are used as substrates for the epitaxial growth of basic material for light emitting diodes, the Czochralski liquid encapsulation technique was developed. After preliminary experiments in a small puller, the parameters for crystal growth were tested and optimized in pulling equipment

which was specially constructed for this purpose. Methods for diameter control were tested as well. By means of production scale pulling of crystals with a diameter of 50 mm and a weight of 1.4 kg with dislocation densities of 50,000/sq. cm the objective was fully achieved.

N82-14950/1 PC **A04**/MF **A01**
Wacker-Chemie G.m.b.H., Burghausen (Germany, F.R.).
Research and Development on Technologies for the Preparation of III-V Semiconductor Materials and on Methods for Evaluation of the Quality of These Materials: Gallium Arsenide Crystals, Gradient Freeze Crystal Growth and Measurement Techniques.
Final Report.
F. Kuhn-kuhnenfeld. Feb 81, 75p BMFT-FB-T-81-023, ISSN-0340-7608
Partly in German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

A gradient freeze technique was developed for the growth of GaAs crystals with low dislocation densities in closed quartz containers, using directional solidification. Such GaAs substrates are required for the manufacture of infrared light emitting diodes and other III-V devices. Crystal size (up to 1kg) and quality (crystal densities from 1000 to 10,000 cm E-2) are in accordance with present market requirements. The electrical parameters of III-V materials were determined by the van der Pauw method, and also by an eddy current method. Crystal perfection was evaluated by selective photoetching and chemical etching in H2SO4-H202-HF solution. Photoluminescense and photoelasticity measurements were also conducted on the III-V-materials.

PB82-152612 Not available NTIS
National Bureau of Standards, Washington, DC.
A LEED Inquiry into the Question of Reconstruction of (001)Nb,
A. J. Melmed, S. Ceyer, R. T. Tung, and W. R. Graham. 1981, 4p
Grant NSF-DMR80-0905
Pub. in Surface Science Lett. 111, pL701-L704 1981.

The authors have examined the structure of the (001) surface of Nb by LEED and have found that a (1X1) diffraction pattern prevails over the entire range of temperature investigated, that is about 15 - 500K. This is the first observation of an unreconstructed (001) surface of a BCC metal over such a temperature range.

20C. Electricity and Magnetism

PB82-152422 Not available NTIS
National Bureau of Standards, Washington, DC.
Augmented Electric- and Magnetic-Field Integral Equations.
Final rept.,
Arthur D. Yaghjian. 1981, 15p
Pub. in Radio Science 16, n6 p987-1001 Nov/Dec 81.

In 1949 Maue derived an electric-field integral equation (EFIE) and a magnetic-field integral equation (MFIE) for the surface current density Ks excited by arbitrary harmonic fields incident upon a perfectly conducting body in free space. A major flaw in these equations is that they fail to yield a unique solution for Ks at frequencies equal to the resonant frequencies of the corresponding interior cavity. In this paper, methods are presented for augmenting the EFIE and MFIE separately to eliminate the spurious resonant solutions from the exterior region without sacrificing the basic simplicity, solution capability and pure electric- and magnetic-field character of these two elegant equations. Included is an explanation of why the original EFIE and MFIE are deficient in the exterior region.

PB82-152430 Not available NTIS
National Bureau of Standards, Washington, DC.
Augmented Electric- and Magnetic-Field Integral Equations Which Eliminate the Spurious Resonances.
Final rept.,
Arthur D. Yaghjian. 1980, 4p
Pub. in Proceedings of International URSI-Symposium Electromagnetic Waves, Munich, Germany, August 26-29, 1980, p121 B/1-121 B/4.

In 1949, Maue derived an electric-field integral equation (EFIE) and a magnetic-field integral equation (MFIE) for the surface current density (K(vector) sub s) excited by arbitrary harmonic fields incident upon a perfectly conducting body in free space. A major flaw in these equations is that they fail to yield a unique solution for Ks at frequencies equal to the resonant frequencies of the corresponding interior cavity. In this paper, methods are presented for augmenting the EFIE and MFIE separately to eliminate the spurious resonant solutions from the exterior region without sacrificing the basic simplicity, solution capability and pure electric- and magnetic-field character of these two elegant equations. Included is an explanation of why the original EFIE and MFIE are deficient in the exterior region.

PB82-152455 Not available NTIS
National Bureau of Standards, Washington, DC.
A Delta-Distribution Derivation of the Electric Field in the Source Region,
Arthur D. Yaghjian. 1981, 4p
Pub. in Proceedings of International IEEE Antennas and Propagation Symposium (1981), Los Angeles, California, June 17-19, 1981, IEEE Digest, p334-337.

The derivation of the expression appropriate for the dyadic Green's function in the source region is considered from the standpoint of the theory of distributions, in which the Green's function corresponding to a delta sequence is obtained for the special case of a spherical principal volume. The previously obtained result follows readily from this special case by circumscribing the arbitrary principal volume by the spherical principal volume and evaluating the resultant principal-value integral.

20D. Fluid Mechanics

AD-A108 808/7 PC **A03**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Calculation of Supersonic Three-Dimensional Flow About Blunt-Nosed Bodies,
Youlan Zhu, Ruquan Wang, and Xichang Zhong. 19 Nov 81, 26p Rept no. FTD-ID(RS)T-0927-81
Edited trans. of Peking Li-hsueh (Mechanics) (China) n4 p270-282 1977, by Randy Dorsey.

No abstract available.

AD-A108 983/8 PC **A07**/MF **A01**
Tel-Aviv Univ. (Israel). Dept. of Applied Mathematics.
Finite Elements for Fluid Dynamics. Supercritical Design.
Final scientific rept.,
Nima Geffen, and Sara Yaniv. Oct 81, 135p AFOSR-TR-81-0867
Grant AFOSR-81-0017

The mathematical modeling of a physical continum by a set of first-order partial differential equations is commonly redundant, i.e., it includes more equations than unknowns. A simple analysis gives the reduced set, which fully determines the field quantities satisfying appropriately prescribed initial and boundary conditions. An algebraic look at the system provides the appropriate choice for descretization, which is a necessary condition for solvability and stability. The same is tried for a number of variational representations of the field in terms of primitive variables. A few of the latter formulations are new. (Author)

AD-A109 024/0 PC **A04**/MF **A01**
Colorado Univ. at Boulder. Dept. of Mechanical Engineering.
Analytical Prediction of Turbulent Heat Transfer Parameters.
Annual rept. no. 1, 1 Oct 80-30 Sep 81,
Adrian Bejan. Dec 81, 60p Rept no. CUMER-81-3
Contract N00014-79-C-0006

The objective of this research effort is to construct a purely theoretical foundation for the phenomenon of turbulent heat transfer. In this first annual report, the current methodology of theoretical research is reexamined critically. The report outlines in three self-standing units (papers) the new theoretical viewpoint that turbulence is the result of inviscid flow buckling. This viewpoint leads to first examples of theoretical prediction of turbulence parameters, for instance, the transition to turbulence, the flapping motion of turbulent jets, the frequency of vortex shedding and the meandering and mixing mechanism of thermal plumes. (Author)

AD-A109 077/8 PC **A05**/MF **A01**
New York Univ., NY. Dept. of Applied Science.
Nonlinear Instabilities and Large Scale Structures in Mixing Layers.
Final rept.,
Roberto Vaglio-Laurin, and Nan Suey Liu. Sep 81, 79p NYU/DAS-81-06, AFOSR-TR-81-0854
Grant AFOSR-80-0184

The dynamics of the large scale structures/vorticity concentrations observed in two-dimensional transitional and turbulent mixing layers are described in terms of a nonlinear inviscid two-dimensional instability model. According to the model, the formation and repetitive pairing of the structures reflect a deterministic cyclic mechanism wherein the nonlinear evolution of the finite amplitude instability, which dominates the flow at any one stage, intrinsically provides first excitation of, and then energy transfer to, the bound 1/2 subharmonic. The key to identifying and modeling the mechanism resides in a realistic description of the concurrent changes in the mean flow and in the structure of the wave motion during the amplification, saturation and subsequent modulation of the individual nonlinear instability. Models based on weakly nonlinear stability theory prove inadequate to this task. The cause of the failure is identified, and attendant criteria for estimating the applicability of the theory to the present as well as other problems are indicated. By contrast, several salient features of transitional and turbulent mixing layer development are reproduced by the repeated application of a nonlinear model, which describes the life cycle of the individual structure only in terms of the interactive evolution of the mean flow and of the wave motions associated with an appropriate finite amplitude fundamental together with its bound second harmonic.

AD-A109 084/4 PC **A05**/MF **A01**
Montana State Univ., Bozeman. Supersonic Wind Tunnel Lab.
The Compressible Laminar Two-Dimensional Wake with Arbitrary Initial Asymmetry.
Annual rept. 1 Oct 80-30 Sep 81,
Anthony Demetriades. Jul 81, 86p SWT-81-3, AFOSR-TR-81-0841
Grant AFOSR-80-0267

Closed-form analytic solutions are presented for the two-dimensional laminar wake, which are applicable from the trailing edge to infinite downstream distances, and for any 'initial asymmetry' ratio of the two merging boundary layer thicknesses. An initially exponential velocity profile is assumed, and Gold's treatment is utilized of the evolution of the profile based on the Oseen approximation. The solutions show the effect of edge Mach number, Reynolds number, wall-to-stagnation temperature ratio and asymmetry factor. Beyond a certain distance from the trailing edge the solutions reduce to the well-known asymptotic behavior regardless of the magnitude of these parameters. In the 'non-equilibrium' region from the trailing edge to the equilibration distance, the supersonic/hypersonic cooled wake behaves rather abnormally. The effect of initial asymmetry is to deflect the wake center off the plane of the trailing edge, and to displace the wake center of the velocity relative to the temperature-density center without much affecting the velocity, temperature or density defect magnitudes or the wake thickness. Comparison with earlier work shows very good agreement with the Tollmien-Goldstein implicit solutions near the trailing edge for symmetric incompressible flows. Good agreement is also found with available experimental data. (Author)

AD-A109 188/3 PC **A02**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Aviation and Surface Effects Dept.
Determination of Three-Dimensional Flow Separation by a Streamline Method.
Research and development rept.,
Tsze C. Tai. 18 Feb 81, 17p AERO-1279, DTNSRDC-81/096
Pub. in AIAA Jnl., v19 n10 p1264-1271 Oct 81, AIAA Paper 80-1443R.

No abstract available.

AD-A109 225/3 Not available NTIS
California Inst. of Tech., Pasadena.
Structure of a Linear Array of Uniform Vortices,
P. G. Saffman, and R. Szeto. 23 Nov 79, 27p ARO-15622.29-M
Contract DAAG29-78-C-0011
Availability: Pub. in Studies in Applied Mathematics, v65 p223-248 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14473/4 PC **A03**/MF **A01**
Cambridge Hydrodynamics, Inc., MA.
Numerical Studies of Laminar and Turbulent Drag Reduction.
Final Report.
R. Balasubramanian, and S. A. Orszag. Dec 81, 33p
NASA-CR-3498, CHI-57
Contract NAS1-16237

Two-dimensional incompressible flow over wavy surfaces is studied numerically by spectral methods. Turbulence effects are modeled. Results for symmetric and asymmetric wave forms are presented. Effect of propagating surface waves on drag reduction is studied. Comparisons between computer simulations and experimental results are made.

N82-14475/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Determination of the Transition Point in a Boundary Layer by the Measurement of Pressure Fluctuation.
V. Strach. Dec 81, 14p NASA-TM-76639
Contract NASW-3542
Transl. Into English from Zpravodaj Vzlu (Poland), No. 5, 1980 p 201-205. Original Language Document Was Announced as A81-31040. Transl. By Scientific Translation Service, Santa Barbara, Calif.

A method is developed for determining the laminar-to-turbulent transition point in a boundary layer. The method involves the measurement of pressure on the surface of the body and the computation of pressure fluctuations. This method of determining the transition point is suitable when visualization methods cannot be used.

N82-14487/4 PC **A03**/MF **A01**
Max-Planck-Inst. fuer Stroemungsforschung, Goettingen (Germany, F.R.).
The Temperature Structure of a Turbulent Vortex Ring die Waermestruktur Eines Turbulenten Ringwirbels.
P. E. M. Schneider. Mar 80, 35p MPIS-4/1980, ISSN-0436-1199
Text in German.

Temperature profiles in turbulent vortex rings were experimentally investigated. A test arrangement was used that produces vortices which are visualized by coloring and Schlieren-photography. Temperature profiles were obtained by a hot-film anemometer. Turbulent vortex rings are structures with individual temperature profiles whose temperature is everywhere higher than that of the surrounding medium in test. Temperature measurements show that secondary vortices consist of core material, material from the transition region between vortex core and envelope, and material from the envelope.

N82-14488/2 PC **A06**/MF **A01**
Max-Planck-Inst. fuer Stroemungsforschung, Goettingen (Germany, F.R.).
Transformation and Reflection of Vortex Rings Impinging on a Plate Inclined with Respect to Their Translation Direction Umbildung und Reflexion Eines Ringwirbels an Einer Platte, die Schraeg Zu Seiner Translationsrichtung Orientiert Ist.
P. E. M. Schneider. Jul 80, 101p MPIS-12/1980, ISSN-0436-1199
Text in German.

Reflection processes in turbulent boundary layers were investigated by examining the reflection angle of a vortex ring. The tests were conducted in a vortex generating setup. The vortices were colored and photographed. The primary vortex transforms into an oscillating vortex ring, while secondary vortices develop in its envelope. Reverse flow vortex rings, helix and double-helix vortices develop in its core. The reflection angle at which this new vortex leaves the plate is independent of the distance between the plate and the test stand inlet nozzle where the vortex ring is formed, the flow stability condition (laminar, ondulated, turbulent) of the vortex ring when it arrives at the plate, and the vortex ring translation velocity.

N82-14489/0 PC **A05**/MF **A01**
Max-Planck-Inst. fuer Stroemungsforschung, Goettingen (Germany, F.R.).
Experimental Investigation of Instability Phases of a Laminar Vortex Ring, in Light of Comparable Instability Events in Turbulent Shear Layer, Boundary Layer, and Channel Flows Experimentelle Untersuchung der Instabilitaetsphasen Eines Laminaren Ringwirbels MIT Hinblick Auf Vergleichbare Instabilitaetsereignisse in Turbulenten Scherschicht-, Grenzschicht- und Kanalstroemungen.
P. E. M. Schneider. Oct 80, 99p MPIS-17/1980, ISSN-0436-1199
Text in German.

The laminar flow in a vortex is primarily determined by the toroidal laminar vortex core, the ondulatory flow by the ondulated laminar core, and the turbulent flow by the turbulent oscillating core. Inside these three global vortex flows, locally or globally unstable secondary vortices, and helix and double-helix flows are formed. A turbulence model was established in which turbulent flows consist of a complex organized vortex hierarchy and develop from an invarying degree, rhythmic sequence of unstable, laminar vortices as a result of an evolutional process.

N82-14490/8 PC **A06**/MF **A01**
Max-Planck-Inst. fuer Stroemungsforschung, Goettingen (Germany, F.R.).
Experimental Investigation of the Flow in a Rotating Circular Channel Experimentelle Untersuchung ueber Eine Stroemung in Einem Rotierenden Ringkanal.
Thesis.
J. Kuehl. Nov 80, 101p MPIS-21/1980, ISSN-0436-1199
Text in German.

Mixing devices were studied using flow in a rotating cylindrical annulus with rectangular cross section, in which the medium has a free surface directed towards the rotation axis. The flow is considered as quasi-stationary. The flow is controlled by the equilibrium between pressure gradient and Coriolis force. There exists a frictionless central flow with mainly azimuthal velocity, two Ekman boundary layers perpendicular to the axis, and a boundary outer layer which becomes unstable at higher speeds. In the experiment, the flow was visualized in a stroboscopically illuminated rotating plexiglass channel by coloring. The approximate calculations were checked by means of velocity measurements. The expected Taylor-Gortler vortex was observed.

N82-14881/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Mode Propagation in Nonuniform Circular Ducts with Potential Flow.
Y. C. Cho, and K. U. Ingard. 1982, 15p NASA-TM-82776, E-1086
Presented at the 20TH Aerospace Sci. Conf., Orlando, Fla., 11-14 Jan. 1982.

A previously reported closed form solution is expanded to determine effects of isentropic mean flow on mode propagation in a slowly converging-diverging duct, a circular cosh duct. On the assumption of uniform steady fluid density, the mean flow increases the power transmission coefficient. The increase is directly related to the increase of the cutoff ratio at the duct throat. With the negligible transverse gradients of the steady fluid variables, the conversion from one mode to another is negligible, and the power transmission coefficient remains unchanged with the mean flow direction reversed. With a proper choice of frequency parameter, many different modes can be made subject to a single value of the power transmission loss. A systematic method to include the effects of the gradients of the steady fluid variables is also described.

20E. Masers and Lasers

AD-A108 887/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Spectral Characteristics of External-Cavity Controlled Semiconductor Lasers.
Journal article,
Mark W. Fleming, and Aram Mooradian. 18 Sep 80, 17p JA-5167, ESD-TR-81-322
Contract F19628-80-C-0002
Pub. in IEEE Journal of Quantum Electronics, vQE-17 n1 p44-59 Jan 81.

No abstract available.

AD-A108 954/9 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Intracavity Loss Modulation of GaInAsP Lasers.
Journal article,
Dean Z. Tsang, Steven H. Groves, Joseph P. Donnelly, James N. Walpole, and Jaw J. Hsieh. 1981, 4p MS-5620, ESD-TR-81-313
Contract F19628-80-C-0002
Pub. in SPIE, v269 p81-83 1981.

No abstract available.

AD-A109 118/0 PC **A02**/MF **A01**
Yale Univ., New Haven, CT. Mason Lab.
Degradation in Gain for a Free Electron Laser Amplifier Due to Electron Momentum Spread,
A. Fruchtman, and J. L. Hirshfield. 15 Jun 81, 10p Rept no. 5
Contract N00014-79-C-0588
Prepared in cooperation with Hebrew Univ., Jerusalem (Israel) Center for Plasma Physics. Pub. in International Jnl. of Infrared and Millimeter Waves, v2 n5 p905-913 1981.

No abstract available.

AD-A109 119/8 PC **A02**/MF **A01**
Yale Univ., New Haven, CT. Mason Lab.
Orbit Stability in Free Electron Lasers,
P. Avivi, F. Dothan, A. Fruchtman, A. Ljudmirsky, and J. L. Hirshfield. 2 Jun 81, 11p Rept no. 6
Contract N00014-79-C-0588
Prepared in cooperation with Hebrew Univ., Jerusalem (Israel). Center for Plasma Physics. Pub. in International Jnl. of Infrared and Millimeter Waves, v2 n5 p1071-1080 1981.

No abstract available.

AD-A109 129/7 PC **A03**/MF **A01**
Philips Labs., Briarcliff Manor, NY.
Development of a Novel Laser Material for Miniaturized Laser Systems.
Quarterly technical rept. no. 4, 1 Jul-30 Sep 81,
Walter K. Zwicker, Sel Colak, and Jacob Khurgin. Nov 81, 28p
Contract MDA903-81-C-0034, DARPA Order-4040

Our work during this quarter dealt with the growth and evaluation of NPP crystals for a 1.06 micrometer miniature laser and Er(3+) stoichiometric crystals for an eyesafe miniature laser emitting at 1.54 micrometer. Crystals of NPP up to 2x2x20 mm for fabrication of miniature laser rods were grown by a previously described high-temperature, solution-growth technique. Flash-lamp-pumped lasing experiments were conducted using various sizes of NPP crystals, in both the free-oscillation and Q-switched modes at different pulse repetition rates. Output pulse energies and properties of the laser output beam were measured. The efficiencies for the free-oscillation mode were close to the maximum published values; for the Q-switched mode, the efficiencies were low compared to published values. Crystals of ErP5O14 were grown by the same technique used for NPP; crystals of ErLiP4O12 and ErAl3(BO3)4 were grown by related fluxed-melt techniques. These crystals were several millimeters in size. Both Yb and Gd were added in vrious ratios as sensitizing and/or diluent ions. the absorption and emission properties of the Er3+ luminescence in some samples of ErP5O14, LiErP4O12, and ErAl3(BO3)4 have been studied both in the visible and infrared regions of the spectrum. Preliminary evaluations of these materials for laser applications have been made.

AD-A109 153/7 PC **A07**/MF **A01**
Defense Intelligence Agency, Washington, DC. Directorate for Scientific and Technical Intelligence.
Bibliography of Soviet Laser Developments, Number 49, September-October 1980.
Oct 81, 130p Rept no. DIA-DST-2700Z-004-81
See also report dated 14 Jan 71, AD-729 888.

This is the Soviet Laser Bibliography for September-October 1980, and is No. 49 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; crystal growing; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; laser spectroscopy; beam target interaction; and plasma generation and diagnostics. (Author)

AD-A109 260/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
High Power, CW Atmospheric CO2 Laser Radar Power Amplifier.
Journal article,
Robert T. Ku, and Shen Y. Shey. 1980, 9p MS-5422, ESD-TR-81-304
Contract F19628-80-C-0002, ARPA Order-600
Pub. in Proceedings of the International Conference on Lasers, p543-550, 15-19 Dec 80.

No abstract available.

AD-A109 262/6 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Status of CO2 Isotope Laser Technology,
C. Freed. 1980, 8p ESD-TR-81-306
Pub. in Proceedings of the International Conference on Lasers, p615-622, 15-19 Dec 80.

No abstract available.

N82-14517/8 PC **A05**/MF **A01**
Technische Hochschule, Darmstadt (Germany, F.R.). Lehrstuhl fuer Angewandte Physik.
High Power Gas Laser for Material Processing of Organic and Inorganic Material.
Final Report.
G. Herziger, and K. Banse. Feb 81, 36p BMFT-FB-T-81-025, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Gas lasers in the ultraviolet range were tested with respect to their applicability for micromachining of thin films. A system which is able to remove volumes 1 cu micron of target supporting layers, without damaging them or their surroundings was developed. A KrF TEA excimer laser proved to be best suited. With this system, the projected performance (P = 50.000W T = or 2 X 10E minus 8sec) is exceeded. The direct absorption of 40 to 100 nsec laser pulses in the target yields shock free material processing. Long pulse TEA laser action, however, is only realized if preionization and system parameters are properly adjusted so that the laser discharge is homogeneous throughout the whole pulse length. The expected advantages of short wavelengths with regard to direct absorption of radiation in the target at reduced shock load was demonstrated.

PATENT-4 300 106 Not available NTIS
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Large Volume Multiple-Path Nuclear Pumped Laser.
Patent,
F. Hohl, and R. J. Deyoung. Filed 21 May 79, patented 10 Nov 81, 4p N82-13415/6, PAT-APPL-6-041 141
Supersedes PAT-APPL-6-041 141, N79-26385 (17 - 17, p 2266).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Large volumes of gas are excited by using internal high reflectance mirrors that are arranged so that the optical path crosses back and forth through the excited gaseous medium. By adjusting the external dielectric mirrors of the laser, the number of paths through the laser cavity can be varied. Output powers were obtained that are substantially higher than the output powers of previous nuclear laser systems.

PB82-152083 Not available NTIS
National Bureau of Standards, Washington, DC.
Unified Approach to Multiphoton Lasers and Multiphoton Bistability,
M. Reid, K. J. McNeil, and D. F. Walls. Oct 81, 15p
Pub. in Physical Review A 24, n4 p2029-2043 Oct 81.

This paper presents a unified theory of nonequilibrium transitions which occur in radiation interacting via an n-photon transition with atomic systems inside optical cavities. Incoherent pumping of the atoms and coherent driving of the cavity are included. Examples of such systems are the n-photon laser, the n-photon laser with injected signal, and n-photon optical bistability. The state equation and stability conditions for these phenomena are derived. Fluctuations are included via a Fokker-Planck equation in the constant diffusion approximation for which potential solutions may be obtained in the steady state. Using these solutions, moments of the photon distribution are calculated for the above system in the specific cases of one-photon and two photon transitions.

20F. Optics

AD-A108 764/2 PC **A04**/MF **A01**
Hughes Research Labs., Malibu, CA.
Polarization-Independent Optical Waveguide Switch.
Final rept. 12 Sep 80-12 Sep 81,
O. G. Ramer. Oct 81, 70p
Contract N00173-80-C-0439

This highly successful program has resulted in the demonstration of an electrically activated planar waveguide polarization independent switch, one of the key components required to implement signal processing components. These switches operate at a wavelength of 0.83 micron and have optical crosstalk values of less than 20 dB. The switch is based on the delta beta-reversal directional coupler switch. The polarization independence is incorporated in the delta beta reversal switch by tapering the coupling strength of the directional coupler, and by fabricating the waveguides so that the integrated coupling coefficients for TE and TM modes are nearly identical. (Author)

AD-A108 772/5 PC **A03**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Chemical Systems Lab.
An ASCII FORTRAN Subroutine for Computing the Electromagnetic Radiation Scattered by a Sphere.
Technical rept. for period ending May 80,
Merrill E. Milham. Nov 81, 43p Rept no. ARCSL-TR-81088

This report describes the ASCMIE subroutine for performing Mie scattering calculations by means of the downward recursion algorithm developed by J. V. Dave. ASCMIE is written in UNIVAC 1100 series ASCII FORTRAN language. The ASCII FORTRAN compiler is a modern, state-of-the-art compiler which implements the ANSI FORTRAN 77 standard; this compiler is intended as a future replacement for the UNIVAC 1100 series FORTRAN V compiler. Rather than carry out a straightforward conversion of the FORTRAN V Mie scattering routine to ASCII FORTRAN, the code was completely rewritten in order to incorporate new ASCII FORTRAN language elements. The result is a more structured, modular, Mie scattering code which executes faster than the FORTRAN V code. (Author)

AD-A108 920/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Cross Coupling and Aliasing in Modal Wave-Front Estimation.
Journal article,
Jan Herrmann. 14 Oct 80, 5p JA-5153, ESD-TR-81-320
Contract F19628-80-C-0002, ARPA Order-600
Pub. in Jnl. of the Optical Society of America, v71 n8 p989-992, Aug 81.

No abstract available.

AD-A109 138/8 PC **A06**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Scattering from a Vegetation Layer with an Irregular Vegetation Soil Boundary.
Technical rept. Jun 79-Jun 80,
Richard A. Hevenor. Oct 81, 117p Rept no. ETL-0270

See also AD-A071 832.

A theoretical model is computed for the backscattering of electromagnetic waves from a layer of vegetation by using a first-order renormalization technique to determine volume scattering. The vegetation soil interface is assumed rough according to the tangent plane approximation and the scattering from this boundary is added incoherently to the volume scattering result. The mean wave in the vegetation is obtained using a bilocial approximation of the Dyson's equation. A free space dyadic Green's function is used, along with a correlation function of the dielectric fluctuations that are exponential in form and that also possess different correlation lengths l sub x, l sub y, and l sub z in the x, y, and z directions. Effective propagation constants are obtained for both horizontal and vertical polarization. The scattered wave is solved for by using a two-dimensional Fourier transform technique, and the boundary conditions at either end of the vegetation layer are matched. The far field backscatter coefficients are computed for both horizontal and vertical polarizations. The mean and variance of the dielectric fluctuations are calculated with the aid of Peake's model for the dielectric constant of vegetation. The theory is matched to experimental data taken from a corn field. The resulting values for the correlation parameters are then used to monitor the growth pattern of the corn field over a period of time. Comparisons between the theoretical and experimental results over this time period are shown. The theory is also matched to experimental data from spring and fall deciduous trees. (Author)

AD-A109 277/4 PC **A04**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
Backscatter and Extinction in Water Clouds.
Final rept.,
R. G. Pinnick, S. G. Jennings, Petr Chylek, and Chris Ham. Oct 81, 52p Rept no. ERADCOM/ASL-TR-0097

Atmospheric clouds can adversely affect the operation of military electro-optical systems, particularly under slant path scenarios. The probing of clouds by the lidar technique, in which a short pulse of laser radiation scattered backwards by the cloud droplets is detected, is attractive for two reasons. First, it is a remote sensing technique, and measurements at ranges of several kilometers are possible. Second, it can give a two-dimensional picture of the cloud and trace its time-development. Unfortunately, in some cases meaningful information from a lidar backscatter signal is hard to obtain. If the backscatter signal could somehow be related to a more interesting quantity, for example the extinction coefficients, the value of the lidar measurement would increase substantially. In this report a linear relation between the volume extinction coefficient and backscatter coefficient of atmospheric cloud at visible and near-infrared wavelengths is derived. The relation is in good agreement (within 50 percent) with Mie calculations of extinction and backscatter coefficients based on 156 measurements of cloud droplet spectra in cumulus and stratus type clouds. The relation suggests that visible or near-infrared extinction coefficients in a cloud of unknown type could be inferred from lidar backscatter measurements alone, at least near the cloud boundary where the contribution of multiply scattered photons to the lidar return signal can be neglected. No similar size-distribution-independent relation between backscatter coefficient and liquid water content of cloud is found, suggesting that cloud liquid water content cannot be inferred solely from lidar backscatter measurements.

AD-A109 411/9 Not available NTIS
California Univ., Los Angeles. Dept. of Physics.
Scattering Losses in Single and Polycrystalline Materials for IR Fiber Applications,
J. A. Harrington, M. Braunstein, B. Bobbs, and R. Braunstein. 1981, 11p ARO-14249.11-P
Grant DAAG29-79-G-0047
Availability: Pub. in Advances in Ceramics, Physics of Fiber Optics, v2 p94-103 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 422/6 Not available NTIS
California Inst. of Tech., Pasadena.

A Tunable Narrowband Optical Filter via Phase Conjugation by Nondegenerate Four-Wave Mixing in a Doppler-Broadened Resonant Medium,
Joseph Nilsen, and Amnon Yariv. 22 Jun 81, 6p
ARO-17002.8-P
Availability: Pub. in Optics Communications, v39 n3 p199-204, 1 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14402/3 PC **A04**/MF **A01**
Zeiss (Carl), Oberkochen (Germany, F.R.).
Development of New Production Technologies for Optical Components with Spherical Surfaces.
Final Report.
H. J. Juranek. Feb 81, 68p BMFT-FB-T-81-032, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Spherical surfaces for precision optical components were produced by a two-step method instead of the three-step method. The two-step method is known in ophthalmic optics, but did not succeed in precision optics because of the lack of fast high precision grinding machines. Such a machine was built, using special spindles and numerical control. A computer controlled high precision centering and edging machine was built in order to enhance productivity and accuracy and to enable optical shops to produce even complicated lens shapes in an economical way.

N82-14915/4 PC **A06**/MF **A01**
Centre National de la Recherche Scientifique, Marseille (France). Inst. de Mecanique des Fluides de Marseille.
Foc F/96 Polarizers.
M. Saisse. 17 Sep 80, 103p

No abstract available.

PAT-APPL-6-317 662 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Wavelength Selective Fused Single-Mode Fiber Couplers.
Patent Application,
Mathew N. McLandrich. Filed 2 Nov 81, 11p AD-D009 070/4
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

An apparatus and method of entering and extracting a discrete wavelength of optical data in a single-mode duplex optical data transmission system relies on a selective evanescent field coupling. A continuous single-mode fiber transmits the two wavelengths in opposite directions with respect to each other. A length of a like single-mode fiber is fused to the continuous single-mode fiber such that the product of the fused length and the coupling coefficient of the fiber pairs equals pi/2 at one of the optical frequencies to effect one-hundred percent evanescent field coupling to and from the continuous fiber.

PB82-152794 Not available NTIS
National Bureau of Standards, Washington, DC.
Determination and Correction of Quadrature Fringe Measurement Errors in Interferometers.
Final rept.,
Peter L. M. Heydemann. Oct 81, 3p
Pub. in Applied Optics 20, p3382-3384, 1 Oct 81.

The precision and accuracy of interferometers using quadrature fringe detection is often limited not by the interferometer itself, but by the detector system. There are three typical errors: unequal gain in the two channels, quadrature phase shift error, and zero offsets. This paper describes a simple method for determining the quadrature errors from experimental data obtained in the interferometer and correcting for them. A numerical example demonstrating the significant improvement in the precision of interferometer data is given.

20G. Particle Accelerators

AD-A108 935/8 PC **A05**/MF **A01**
RAND Corp., Santa Monica, CA.
The Development of High-Intensity Negative Ion Sources and Beams in the USSR.
Technical rept.,
Nikita Wells. Sep 81, 81p Rept no. RAND/R-2816-ARPA
Contract MDA903-78-C-0189, ARPA Order-3520

This report reviews Soviet R and D of (1) high-intensity negative ion sources and (2) transport and focusing of negative ion beams, using Soviet open literature of the past ten years, and correlates this data with data on Soviet institutes responsible for negative ion beam development. The Soviets are developing intense negative ion beams as the basis for creating neutral beams for injection into mirror traps and tokamaks, for inertial confinement fusion, and possibly for exoatmospheric beam weapon applications. The report focuses specifically on surface-plasma-type ion sources, which were first developed in the USSR and which show great promise for creating beams of high intensity, high brightness, and low emittance. Mechanisms for optimum negative ion beam transport are also discussed.

AECL-6788 PC **A08**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Progress Report, Physics Division, 1 October - 31 December, 1979.
Feb 80, 151p PR-P-124
U.S. Sales Only.

Kinemetic shifts have been measured in the beta -delayed alpha -decay of exp 20 Na in order to deduce beta - nu angular correlations. Analysis of the data is in progress. In a significant advance in techniques to measure quadrupole moments of isomeric states, the electric field gradient experienced by exp 147 Gd isomers was determined in a target of single-crystal gadolinium using Coulomb excitation. Commissioning of the Alvarez accelerator for the High Current Test Facility continues. The Alvarez tank has been cleaned, reassembled with some modifications and subjected to initial steps of rf conditioning. A successful test was made of the radiation processing facility. A current of 6 mA was accelerated to 4 MeV and allowed to pass through a 0.75 mm stainless steel window into the fast-flowing cooling water. Conversion measurements were carried out with 19-element thorium and 7- and 37-element uranium targets. (Atomindex citation 11:571944)

AECL-6956 PC **A06**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Progress Report, Physics Division, 1 January - 31 March, 1980.
May 80, 125p PR-P-125
U.S. Sales Only.

Measurements of g-factors by the enhanced transient magentic field method but using cooled Gd instead of iron as the ferromagnet were begun. The method shows great promise for improved performance. The ISOL on-line isotope separator is operating well. During the quarter it was used for branching ratio studies in the beta-decay of exp 20 Na and for on-line tests of new targets. Changes to the vacuum manifold, plumbing lines and rf window have led to overall improved operation of the Alvarez accelerator, A vacuum failure in one of the drift tubes has caused a delay in the beam testing program. Analysis of conversion yield data for uranium and throium targets is proceeding. Characteristic differences have been found in the radial distributions of fission products and of conversion products, the latter being broader for both targets than the former. Good agreement was obtained in neutronics calculations of the spatial variation of neutron threshold, fission and capture reaction rates and overall neutron balance with experiments done at AWRE on a large thorium metal assembly with central 14 MeV neutron source. Operations of the MP Tandem Accelerator and the main site computing facilities is also summarized. (Atomindex citation 11:571948)

AERE-M-3138 PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Metallurgy Div.
Harwell 80/500 KeV Dual Beam Facility.
J. W. Muncie, and J. H. Evans. Dec 80, 11p
U.S. Sales Only.

Up-dated information is presented on a dual-beam facility in which a small 80 keV accelerator is linked to the 500 keV Cockcroft-Walton machine. Operating procedures are given in detail for the 80 keV machine and the modified vacuum system. (Atomindex citation 12:605370)

ANU-P-805 PC **A02**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Survey of Large NEC Accelerators: 1981.
D. C. Weisser. Apr 81, 16p
U.S. Sales Only.

A survey of the performance of large NEC accelerators is presented with emphasis on voltage performance and corona voltage distribution systems. The rf impedance of combinations of accelerator tube, closed corona tube and column is discussed. The role played by SF sub 6 break-down products on corona systems is explored and new observations of deposits on corona needle tips are shown. Expectations of future performance of large NEC machines are given. (Atomindex citation 12:616379)

CEA-CONF-5290 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Lab. National Saturne.
Bunched-Beam Instabilities.
J. L. Laclare. Jul 80, 14p CONF-800740-30
11. international conference on high energy accelerators, Geneva, Switzerland, 7 Jul 1980.
U.S. Sales Only. Microfiche only after original copies are exhausted.

In this attempted synthesis, longitudinal and transverse instabilities will be expounded in parallel. The main results are presented here, while detailed derivations are given elsewhere. Landau damping is very briefly mentioned. Justification for this is that a companion invited paper on diagnosis and cures by A. Hofman should lay more emphasis on it. (Atomindex citation 12:578133)

CEA-N-2132 PC **A02**/MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Design of a exp 7 Li Rotating Target for Neutron Production Using a Van de Graaff Accelerator.
S. Seguin. Jun 80, 13p
In French.
U.S. Sales Only.

We present a rotating target used for the production of monokinetic neutron fluxes. The neutrons are produced from the exp 7 Li(p,n) exp 7 Be reaction for fast neutron elastic and inelastic scattering experiments. This target has been operated with a proton beam current of 8 to 10 mu A during six consecutive weeks and has given entire satisfaction. (Atomindex citation 11:570969)

DESY-L-Ueb-244 PC **A03**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Induced Radioactivity in the Air of the 300 GeV Proton Accelerator at CERN.
A. Rindi. Mar 80, 28p CERN-LAB-II-RA-72-5
In German.
U.S. Sales Only.

This contribution investigates the formation of radioactive elements which may be produced by the interaction of high-energy particles, thermal neutrons and gamma particles on the one hand, and the components of air within the tunnel of the 300 GeV proton accelerator on the other. The radioactive element concentration in the air at the outlet of the air conditioning system and the dispersion in the atmosphere has been calculated. It is shown that exp 13 N, exp 15 O, exp 11 C, and exp 41 Ar are the radioactive products occuring in calculable concentrations. The concentrations are below the maximum permissible values. (Atomindex citation 11:570971)

DE82004032 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Div. of High Energy Physics.
Interim Report of the Subpanel on Long-Range Planning for the US High-Energy Physics Program of the High-Energy Physics Advisory Panel.
Nov 81, 31p DOE/ER-0112

The Subpanel strongly recommends that the ISABELLE project go forward and be completed during this decade. ISABELLE provides a major new facility that will enable the US High Energy Physics Program

to remain active and healthy during this decade and into the next. ISABELLE construction and the other essential components of the US Program require a minimum annual level of support that averages $440M (FY 1982 dollars) in DOE funds per year. If support at this level cannot be made available in time for ISABELLE completion within this decade, the ISABELLE project cannot be continued. (ERA citation 07:005133)

FEI-1024 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Pulse Operation of the FEI EG-1 Electrostatic Accelerator.
M. V. Bokhovko, V. I. Volodin, A. I. Glotov, N. I. Dudkin, and V. N. Kanaki. 1980, 16p
In Russian.
U.S. Sales Only. Microfiche only after original copies are exhausted.

The pulse injector of the FEI EhG-1 accelerator is described. The injector prowides the accelerator operation in nanosecond and microsecond modes. The results of accelerator performance during 1978-79 years are given. The values of pulse current are: 0.3-0.5 mu A at pulse duration of 15-25nc in the mode of simple chopping mode, and 1.5-2.5 mu A at pulse duration of 2-2.5 nc in the modes of chopping and bunding the microsecond mode pulse duration is 0.1-1 mu c pulse frequency recurrence being 1.5-30 kHz, pulse current 0.3-0.5 mu A. It is noted that both modes of the EhG-1 accelerator pulse operation-nanosecond with bunching and without it and microsecond-were used to conduct experiments on absolute measurement of cross sections of radiation capture of fast neutrons in Uranium-238, on measurement of neutron total cross sections and in a number of other experiments. (Atomindex citation 12:605372)

FEI-1059 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Two-Parametric Technique for Evaluation of the Net Method.
K. A. Pezvykh. 1980, 11p
In Russian.
U.S. Sales Only.

A priori qualitative and quantitative analysis of the net method errors for a certain class of electrostatic designs on the base of specified net pitch and mean radius of the boundary surface curvature is substantiated. The a priori evaluation of the greatest error in the fields of elongated and flattened ellipsoidal condensators differs from true errors not more than 0.85-6.6 times, in the fields of a bell-shaped cable junction box and high voltage accelerator not more than 1.2-9.3 times. Among known evaluation methods potential comparison in one and the same unit on net reducing is applicable in the vicinity of the boundary with the greatest curvature and is not applicable in the field of obtuse ellipsoid vertex at great errors at the artificial boundary. This method requires at least a twofold calculation and ensures an evaluation being 1.2-3 times less than the true error. (Atomindex citation 12:616398)

IFVE-OEA-79-156 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Operator Console Electronics of the Ejection Control System.
V. V. Komarov, A. K. Pudovkin, N. N. Trofimov, and Yu. S. Chernous'ko. 1979, 12p
In Russian.
U.S. Sales Only.

Considered is a block diagram and main elements of operator console equipment for the beam extraction automatic control system of U-70 accelerator. Given is a interface scheme of control desk electronic equipment, concentrated in CAMAC frame with PDP-81E computer. An organization peculiarity of the described equipment is solving a number of problems on survice of control desk devices by means of the off-line controller microprogram. Shown is the scheme of problem division among the computer program, controller microprogram and proper hardware. The suggested equipment gives possibility to exercise information output on raster (256x256 points) television displays, as well as coding and input of information from the control desks. Introduction of off-line control on the level of CAMAC frame permits to get the computer free from comparatively simple, often repeated operations of building standard image elements, to essentially simplify proper hardware of the system. (Atomindex citation 12:608144)

IFVE-OI-80-48 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
High-Frequency Beam Matching at the Input of an Ion Linac with Uniform Spatial Quadrupole Focusing.
G. N. Dernovoi, and A. P. Mal'tsev. 1980, 13p
In Russian.
U.S. Sales Only.

.There is offered a matching device at the input of an accelerator with quadrupole spatial-uniform high-frequency focusing, which removes phase dependence of the accelerator acceptance and essentially reduces the growth of the beam emittance in the acceleration process. The matching theory is given and mathing conditions are formulated. Working ability of the smooth envelope method for the initial part of the accelerator and its applicability for investigating the coordination problems is shown. Comparison of the obtained data shows, that the effective acceptance increases approximately twice during the use of the coordinating device. For most of the input phases the acceptance becomes practically phase-independent. (Atomindex citation 12:605373)

IFVE-OKU-79-167 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Ring Injector of the IHEP Accelerator. 1. Characteristics of the Longitudinal Motion.
E. A. Myaeh, P. T. Pashkov, and A. V. Smirnov. 1979, 12p
In Russian.
U.S. Sales Only.

Main stages of the 1.5 GeV IHEP synchrotron (fast booster) accelerating cycle are considered. Calculated characteristics of the particle longitudinal motion are given. Requirements for accelerating voltage and accelerator magnetic field are formulated. Tolerances on the system parameters for a new injector are obtained. The admissible value of longitudinal coupling impedance in a booster is calculated. It is noted that the admissible value of longitudinal impedance in the booster is considerable, and the noticeable increase of longitudinal bunch volume due to longitudinal multipole instabilities is unlikely. (Atomindex citation 11:570974)

IFVE-OKU-80-135 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Study on Accelerating Resonators of the IFVE Proton Synchrotron.
A. M. Gudkov, I. I. Sulygin, and B. K. Shembel. 1980, 17p
In Russian.
U.S. Sales Only.

Results of the analysis and experimental study on stable acceleration of proton beam in the IHEP synchrotron are presented. Proton beam intensity will be increased up to 5x10 exp 13 proton/cycle with the particle booster putting into operation. Accelerating system, consisting now of 50 accelerating stations, will be substituted for 40 ones. The technique and results of investigation of accelerating cavities of new stations are presented. Decreasing of branch resistance of cavities was experimentally observed with the help of high-resistance measuring line, formed by fine wire elongated along the cavity axis and external surface of its central tube. Investigations, carried out, have shown that accelerating cavities of existing accelerating stations do not create conditions for longitudinal beam instabilities at the intensity level up to 1x10 exp 13 proton/cycle. Measures, adopted at new stations designing and changes put into them according to the results of the tests of experimental 'I-type - straight probe, and 'L'-type - bend probe. The void meter were calibrated comparing with the gamma void meter and the air flow rate. The set of used the measuring length can be enlarged up to a torus has been made. (Atomindex citation 12:616399)

IFVE-OP/ONF-79-170 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Technique for Wide Spectrum nu sub(Mu)(Anti nu sub(Mu)) Beam Forming at the TeV Energy Accelerators.
D. S. Baranov, and V. L. Rykov. 1979, 24p
In Russian.
U.S. Sales Only.

Considered is a method of forming neutron and muon beams of superhigh energies with a wide energy spectrum. Beams are formed by means of a focusing device with a weak (of the order of 1-3 kGs) axial-symmetric magnetic field, dispersed along the whole length of decay region of the neutrinic channel. The magnetic field is excited by the current, passing in a thin central conductor. Given are calculation results, characterizing efficiency of this device application. The calculations are carried out for proton energies 1.5 and 3 TeV. Given are comparative curves, characterizing behavior of neutrino spectra with the change of focusing filament parameters. Presented are calculation results, showing change of neutrino fluxes with the change of the channel length. Discussed is a principle possibility of combining in one channel including focusing filament, schemes of beam formation of three different types: nu /sub mu /(anti nu /sub mu /) beam with a wide energy spectrum, nu /sub mu /(anti nu / sub mu /) dichromatic beam, muon beam. Transition from the scheme of one beam formation to another is carried out only by the change of target location, supply regimes of magnetic elements, the degree of collimator exposing, etc. without transfer and replacement of the channel equipment. (Atomindex citation 11:570976)

IFVE-OUNK/ORI-80-17 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Problems Connected with Particle Extraction from Superhigh-Energy Accelerators.
V. N. Lebedev, N. V. Mokhov, K. P. Myznikov, and Yu. S. Fedotov. 1980, 15p
In Russian.
U.S. Sales Only.

With the purpose of increasing the operating efficiency of an accelerator with an energy of the order of thousands of GeV, main problems are considered which arise when extracting a proton beam from such an accelerator. Estimates of radiation heating of wire septum magnets, external targets and emergency absorbers under the action of the extracted proton beam are given. Probable measures on protection of the main equipment from radiation effects are discussed. It is shown that the best method of slow extraction is a resonance extraction with the use of the 3rd-order nonlinear resonance of betatron oscillations. High efficiency of this method, provided necessary measures are taken to protect superconducting elements in the extraction gap, makes it possible to attain an extracted beam intensity of the order of 10 exp 14 protons at an energy of up to 3000 GeV and extraction duration of 10-20 s. Fast extraction is proposed to be realized portionwise on the magnetic field plateau. (Atomindex citation 12:578136)

IFVE-OUNK-79-161 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Measurement and Calculation of Dynamical Losses in a Pulse Dipole Magnet.
V. A. Vasil'ev, Yu. P. Dmitrevskii, A. V. Zlobin, V. F. Kurshetsov, and L. M. Tkachenko. 1979, 15p
In Russian.
U.S. Sales Only.

Measurement of dynamic losses in a pulse dipole SP-magnet DA-1-1, made of transposed wire of the rezerford type on the NT-50 alloy basis is carried out to reduce heat-evolution in superconducting (SC) magnets. The wire consists of 12 conductors with 1 mm diameter with 1045 filaments of 0.02 mm diameter. Dynamic losses have been measured in the cycles with the current value from 50 A to 3300 A by electrical methods. Properties of winding material, taken into account in the calculation, particularly, critical current density and effective cross section resistances of wires and transposed wire, have been determined by different methods. For providing experimental works produced is an electronic scheme for measuring dynamic losses. Developed is a calculating program "POWER - 30" for calculation of losses in pulse superconducting magnets, permitting to carry out calculations in computers in three-dimensional geometry. A satisfactory agreement of experimental and calculated data is obtained. (Atomindex citation 11:570977)

IFVE-OUNK-80-138 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Problems of Superconducting Magnet Cooling under Beam Induced Heating Conditions.
A. I. Ageev, Ya. G. Vinokur, and I. P. Vishner. 1980, 11p
In Russian.
U.S. Sales Only.

In IHEP accelerating storage complex (ASC) it is planned to attain the 5x10 exp 14 proton/impulse intensity. In the superconducting coils of the ACS magnets considerable radiation heat release is possible due to particle losses. By evaluations the value of this heat release can constitute dozens of watts per magnet meter. At such heat release an insufficiently intensive heat dissipation from the superconducting coil and an unsatisfactory hydrodynamics of helum flow in the magnet can lead to an inadmissible superconductor temperature increase to the critical one and the emergency transition of coils to normal state. Under these conditions the magnet construction and the method of superconducting ccoil cooling must ensure intensive heat dissipation from superconducting cables to helium. The evaluation of superconducting cable heating in magnets with different coil structures is performed. It is shown that at heat releave more that ten watts per meter of the magnet length the superconducting cable heating to a considerable extent depends on coil structure, electric insulation as well as on type and parameters of the coolant. The calculation results allow to outline ways of superconducting coils construction. At the coil structure choice an important factor is its manufacturing technology simplicity. The economical performance conditions of the external cryogenic system ensuring helium pumping through long magnet chains should be also taken into consideration. It is shown that underheated helium application is not optimal at increased heat release magnet performance. It is suggested to use boiling two-phase helium for the ASC magnet cooling. To ensure high magnet efficiently with increased heat release it is recommended to reduce thermal resistance of electric isolation coil coating. (Atomindex citation 12:616400)

INIS-mf-6240 PC **A04**/MF **A01**
Utrecht Rijksuniversiteit (Netherlands). Robert van de Graaff Lab.
Annual Report 1979.
Jul 80, 56p
U.S. Sales Only.

The sections included are entered in the data base separately. (ERA citation 07:004988)

IPNO-PhN-80-08 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Beam-Transport System for High-Resolution Heavy-Ion Spectroscopy.
P. Roussel, and E. Kashy. 1980, 19p
In French.
U.S. Sales Only.

A method is given to adjust a beam-transport system to the requirements of high-energy resolution heavy-ion spectroscopy. The results of a test experiment performed on a MP tandem with a exp 12 C beam are shown. A drastic improvement in energy resolution is obtained for a kinematical factor K=1/p dp/dtheta=0.12. (Atomindex citation 11:564193)

ITEF-143(1980) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Accelerating Complex for Heavy-Ion Inertial Fusion.
P. R. Zenkevich, I. M. Kapchinskii, and D. G. Koshkarev. 1980, 12p
In Russian.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Parameters of the accelerating and storage complex of heavy ions (ACHI) for the thermonuclear reaction initiation are presented. The ACHI consists of a linear resonance accelerator with the uranium ion current of 200 mA at pulse duration of 1.7 mu s and 20 GeV energy. The subsequent scheme is provided for the increase of the beam current up to 30 kA: linear accelerator - debuncher - "injecting" storage ring - "compressive" storage rings - distributing rings - target. It is expected that 18 beams fall on a target. The main parameters of the formed beam are: energy of 3MJ, beam power of 30 TW, transversal phase volume of 6, cmxmrad, angular beam divergence of 30 mrad. The target radius is 2.4 mm. (Atomindex citation 12:605379)

JINR-R-10-80-623 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
System for Automatic Control of the RF Voltage Beam Phase for the Isochronous Ring Cyclotron on the Basis of the ES-1010 Computer.
V. N. Anosov, Yu. N. Denisov, V. A. Saenko, A. V. Kalmykov, and Z. N. Shishlyannikova. 1980, 10p
In Russian.
U.S. Sales Only.

The system of automatic control of the beam phase relative to the RF voltage for the JINR isochronous ring cyclotron is described. The ES-1010 minicomputer is used. The system consists of the CAMAC beam phase measuring device and the trim coil current setting device. The accuracy of the current settings is (1-2)x10 exp -3 . The fitting accuracy of the given phase curve after 3-4 corrections is +-2-3 deg. One cycle of the beam phase correction at the pulse regime of the cyclotron (pulse width - 100 mu s, frequency - 100 Hz) is 50 s, when the time of the phase measuring at the 12 pickup electrodes is 48 s. (Atomindex citation 12:616402)

JINR-R-11-12661 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Package of the Computer Codes for the Calculating Electromagnetic Excitation of Semiinfinite Coaxial Waveguides by a Moving Source.
A. Sh. Irkegulov, and A. B. Shvachka. 1979, 9p
In Russian.All-union seminar on mathematical physics program complexes, Dnepropetrovsk, Ukrainian SSR, 1979.
U.S. Sales Only.

A simplified block diagram and general description of the program batch intended for calculation of electromagnetic excitation of the coaxial waveguide system with two boundary discontinuities by a resting and moving along the axis annular bunch with current are presented. The batch of the computer codes has been realized on the SDS-6500 and BESM-6 computers using the FORTRAN language. Due to the module structure the batch described can be used for calculation of dynamic characteristics of the excited radiation field. Some of the computer codes calculate the density and energy flux in various areas of the waveguide system and the values of the radiation force acting on the annular bunch. (Atomindex citation 11:571057)

JINR-R-7-80-515 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
KRION-2 Cryogenic Electron Beam Ionizer.
E. D. Donets, and V. P. Ovsyannikov. 1980, 11p
In Russian.
U.S. Sales Only.

The construction of the "KRION-2" cryogenic electron beam ionizer is described in short. Results of investigations of ion behaviour in the electron beam of the ionizer and experiments on the production of highly charged state ions are considered. The cryomagnetic and electron optic systems of the ionizer are shown to provide a 2.25 Tl magnetic field induction of the focusing solenoid, a residual gas pressure of less than 10 exp -12 Torr in ionization space, an electron beam density of up to 600 A/cm exp 2 and electron energy of up to 22 KeV. The ionization factor (product of the electron flux density and the time of electron-ion interaction) up to 3.1x10 exp 21 cm exp -2 is achieved experimentally at the electron energy of about 18 KeV. The ions of carbon, nitrogen, oxygen, neon, argon, Kr exp 34+ and Xe exp 48+ were obtained from the ionizer. (Atomindex citation 12:605381)

JINR-R-9-80-349 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Deflector Section of the Linear Accelerator (The LIA-30).
V. A. Shvets. 1980, 9p
In Russian.
U.S. Sales Only.

Design and testing results of standard sample of the LIA-30 deflector section are discussed. A standard set of apparatus of the monochromatization system is described which is intended for supplying the deflector section. It is intended for forming a monochromatic beam on the output of the LIA injector a high-current electron gun. Parameters of the monochromatic beam have been determined. It is shown that the effect of monochromatization momenta do not distort its structure. (Atomindex citation 12:605382)

JINR-R-9-80-410 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Computer Simulation of the Beam Capture for the JINR Phasotron.
S. B. Vorozhtsov, and V. P. Dmitrievskii. 1980, 12p
In Russian.
U.S. Sales Only.

The analysis of the particle motion in the center region of the JINR high current phasotron is made. The purpose of the investigation was a construction of the diqital model of the particle motion from the ion source up to the stationary phasotron acceleration mode. Synchrotron and betatron radial and vertical particle motion and also space charge repulsion were included into the computer code for the beam investigation. The value 40-45 mkA of the accelerated beam intensity was defined, the space charge effects were appreciated and magnetic field tolerances were obtained. (Atomindex citation 12:605383)

JINR-R-9-80-432 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Study on Two-Dimensional Magnetic Fields by the Harmonic Analysis Method. 3. Determination of Measuring Coil Sensitivity to Magnetic Field.
M. A. Voevodin, and A. D. Kovalenko. 1980, 6p
In Russian.
U.S. Sales Only.

Some problems of determination of measuring coil sensitivity coefficients to magnetic field harmonics are considered. Technique which allows one to improve the accuracy of determining sensitivity coefficients is described. It is based on using the data on calibration in dipole and quadrupole fields to refine geometrical parameters of measuring coils. Results of practical application of this technique are given taking as an example induction measuring coils intended to study characteristics of magnetic field in dipole ma.onets. (Atomindex citation 12:605384)

JINR-R-9-80-578 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Multichannel Automatic System for Measuring the Nonuniformity Index of Synchrotron Magnetic Field on-Line with the ES-1010 Computer.
M. A. Voevodin, V. I. Volkov, L. P. Zinov'ev, A. D. Kovalenko, and N. A. Korukov. 1980, 11p
In Russian.
U.S. Sales Only.

A ten-channel automatic system for fast measurements of an nonuniformity index of a magnetic field in the JINR synchrophasotron is described. Flowsheets of the system under consideration operating on-line with ES-1010 electronic computer as well as data reception and representation programs are given. Peculiarities of a technique for measuring a magnetic synchrophasotron field gradient, main parameters of used selective induction converter, moving platform providing for the displacement of a converter unit inside the accelerator chamber as well as interface equipment of measuring and controlling electronics of the system with the electronic computer are considered. 16000 values of the nonuniformity index at 8 values of magnetic induction have been determined by means of the system described. Measuring time amounted to approximately 20 hours. It.is concluded on the base of results of the system tests that it is possible to use it for fast measurements in weak-focusing accelerators. (Atomindex citation 12:605385)

JINR-10-80-169 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Interactive Program for Charged Particle Beam Transport Systems Computing on the EC-1010 Computer.
B. V. Vasilishin, V. I. Volkov, and I. I. Kulikov. 1980, 11p

In Russian.
U.S. Sales Only.

The EC-1010 computer interactive program for calculating charged particles beam transport system is described. The program input parameters set in the interactive operation mode are the channel lattice and beam characteristics on its entrance. The program calculates the beam parameters in the given points of the channel and permits to output the results on the GD-71 graphic display on a plotter or a line-printer. (Atomindex citation 11:571050)

JINR-13-80-469 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Stable Current Source for Supplying Electromagnetic Elements with a Small Time Constant.
B. D. Omel'chenko, S. V. Kalenov, and V. V. Sustin. 1980, 5p
In Russian.
U.S. Sales Only.

A source of stable current (15 A, 160 V) to supply electromagnetic elements with a circuit time constant of about several milliseconds. The source comprises a thyristor rectifies, a power two-section LCR-filter, a measuring device (resistive current transducer, source of requlated standard voltage), a.d.c. direct current amplifier (using the IUT402A microcircuit) and a unit for compensation of electric network oscillations (UCENO). The UCENO is made in the form of a zero-order measuring device using nonlinear elements (stabilititrons), connected in the diagonals of an electric bridge curcuit, and contains a transistor amplifier. The UCENO output is connected to a control circuit of the thyristor restifier so that this allows a constant current to be held in it when the power line voltage changes sharply by 10 with a dynamic error of $<= 2x10$ exp -4 and a static one of $<=3x10$ exp -5 . The source provides the stability of an average current value of +-2-3x10 exp -4 and the stability of an instantaneous value of +-3-5x10 exp -4 . The source described is intended for supplying the magnetic optic devices of a linear induction accelerator. (Atomindex citation 12:605380)

JINR-18-80-441 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Experimental Set-Up for Ion Radiography. Pt. 2. Software and Results.
Yu. S. Anisimov, Yu. V. Zanevskii, A. B. Ivanov, I. M. Ivanchenko, and P. V. Moisenz. 1980, 7p
In Russian.
U.S. Sales Only. Microfiche only after original copies are exhausted.

A software of experimental set-up for ion radiography is described. It is shown that using helium ion beam of the JINR synchrophasotron the set-up provides the resolution over density better than 0.1% for spatial resolution about 2 mm. The radiation dose of test objects equaled approximately 1 mrad. The stability of energy of extracted 200 MeV/nucleon alpha-particle beam was checked. (Atomindex citation 12:605296)

JINR-9-80-124 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Dept. of New Acceleration Methods.
Accumulation of Heavy Ions in Electron Rings of the Collective Accelerator.
E. A. Perel'shtein, and G. D. Shirkov. 1980, 6p
In Russian.
U.S. Sales Only.

The influence of electron scattering by accumulation of ions and neutral atoms on the cross section of the electron ring is studied. It is shown that the part of scattering is a cause of the increase of the cross section of the ring during the time of accumulation of heavy element ions from the residual gas in the adgezator chamber. The accumulation of xenon and uranium ions from the impulse stream in the prototype of JINR heavy ion collective accelerator has been calculated. (Atomindex citation 11:571052)

JINR-9-80-284 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Dept. of New Acceleration Methods.
Calculation of Electrostatic Field of Heavy Ion Collective Accelerator Corrector and Inflector.
R. Haller, and A. K. Krasnykh. 1980, 10p
In Russian.
U.S. Sales Only.

By means of the equivalent charge method electrostatical field of some elements of injecting system in the collective accelerator of heavy ions - inflector and corrector - was calculated. It is shown that by some variation of the elcctrode geometry, electrical stress, which affects the beam, and the field homogeneity on the beam place could be increased. The results obtained permit one to get some recommendations as to the optimization of constructing these elements. (Atomindex citation 12:581976)

JINR-9-80-31 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Calculation of Phasotron Central Region Optimal Geometry at a Positive Potential on Discharge Chamber of Ion Source.
D. L. Novikov, and N. G. Shakun. 1980, 10p
In Russian.
U.S. Sales Only.

Numerical calculations of motion equation by computer in really simulated magnetic and electric fields of central region of the phasotron with a variable magnetic field indicated that when choosing a definite geometry of central region of an accelerator with the use of ion source with positive potential on discharge chamber conditions could be provided under which the particle beam accelerated up to 30-35 cm radii will have amplitudes of radial oscillations of not more than 1.2 cm. (Atomindex citation 11:571053)

KFTI-79-14 PC **A02**/MF **A01**
Akademiya Nauk URSR, Kharkov. Fiziko-Tekhnicheskii Inst.
To the Question on the Mechanism of Longitudinal Instability of Cyclic Electron Beam in Vacuum.
N. I. Aizatskii, and V. I. Kurilko. 1979, 10p
In Russian.
U.S. Sales Only.

Quantitative analysis of physical processes responsible for mutual wiggling of modulating cyclic beam-radiation and beam bunching has been carried out. The result radiation field of the beam is shown to be a coherent sum of fields of bremsstrahlung of individual electrons and bunching of these electrons in coherently radiating bunches is due to the non-isochrone effect (dependence of frequency rotation on energy). (Atomindex citation 12:605386)

KIYI-79-9a PC **A02**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Yadernykh Issledovanii.
Estimation of 120 cm Cyclotron Parameters for Its Conversion into Isochronous Regime.
E. M. Bel'skii, V. I. Bykov, A. F. Linev, and E. E. Oleinik. 1979, 24p
In Russian.
U.S. Sales Only.

Parameters and sector shim calculation is made for a modernized U-120 classical cyclotron. It is shown that the isochronous 120 cm cyclotron can accelerate much wider particle spectrum than the present one. Possibility of use and alteration of old cyclotron parts is considered. To measure the cyclotron field strength all the equipment constructed for magnetic measurements on U-240 cyclotron can be fully used. (Atomindex citation 11:571207)

NIIEFA-P-B-0440 PC **A02**/MF **A01**
Nauchno-Issledovatel'skii Inst. Elektrofizicheskoi Apparatury, Leningrad (USSR).
Electromagnetic Quadrupole Lense Parameters.
A. V. Popov, and G. N. Samsonov. 1979, 6p
In Russian.
U.S. Sales Only.

Parameters and magnetic characteristics for designed as well as produced and tested quadrupole 18 standard and 4 non-standard lenses, are given. Typical designs, processing technology and wide standardization of units and details form the basis of standard lenses. Aperture of lenses changes from 4 up to 50 cm, length varies from 10 to 200 and magnetic field gradient changes from 24 up to 9500. (Atomindex citation 11:571219)

RL-80-080 PC **A07**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Proceedings of the Second Workshop on Polarised Target Materials.
G. R. Court, T. O. Niinikoski, S. F. J. Cox, and D. A. Cragg. Oct 80, 146p
U.S. Sales Only.

The proceedings are reported of a second international workshop which was convened to consider the use of polarised targets in nuclear research and in particular the experimental difficulties imposed by the limitations of target materials with respect to their relatively low hydrogen content and susceptibility to radiation damage. Papers presented were entitled: (1) Introduction and general review. (2) Theory of dynamic nuclear polarisation. (3) Radiation induced paramagnetic centres in organic and inorganic materials. (4) Dynamic nuclear polarisation with radiation induced free radicals. (5) Radiation damage of chemically doped materials. (6) Chemical doping. (7) Techniques and instrumentation. (8) The use of polarised nuclei in physics with neutrons. (9) The use of polarised targets in high energy physics. (Atomindex citation 12:605391)

20H. Particle Physics

AECL-6851 PC **A03**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Parity Violation in Nuclei: Studies of the Weak Nucleon-Nucleon Interaction.
A. B. Mcdonald. Mar 80, 27p CONF-7906178-4
Canadian Association of Physicists annual congress, Vancouver, Canada, 18 Jun 1979.
U.S. Sales Only.

The Weinberg-Salam Unified Model of weak and electromagnetic interactions has been very successful in explaining parity violation and neutral current effects in neutrino-nucleon, electron-nucleon and neutrino-electron interactions. A wide variety of nuclear physics parity violation experiments are in progress to measure effects of the weak nucleon-nucleon interaction in few nucleon systems and certain heavier nuclei where enhancements are expected. The current status of these experiments will be reviewed, including details of an experiment at Chalk River to search for parity violation in the photodisintegration of deuterium and an extension of our previous measurements of parity mixing in exp 21 Ne. The interpretation of results in terms of basic models of the weak interaction will be discussed. (Atomindex citation 11:561450)

ANU-P-752 PC **A02**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Measurement of the Total Fusion Cross Section for the exp 9 Be + exp 28 Si System.
J. S. Eck, J. R. Leigh, T. R. Ophel, and P. D. Clark. Mar 80, 13p
U.S. Sales Only.

The total fusion cross sections for the system exp 9 Be + exp 28 Si have been measured in the exp 9 Be bombarding energy range 30-60 MeV by the detection of evaporation residues in a delta E ionization chamber-surface barrier detector telescope. Although the measured exp 9 Be + exp 28 Si fusion cross sections are similar to those in which a similar compound system is formed by heavy-ion ($A>=12$) interaction, the ratio of the measured fusion cross section to the total reaction cross section is much smaller than that observed for other systems and is attributed to the structure of exp 9 Be and the ease with which it breaks up into smaller fragments. This view is consistent with the anomalous exp 9 Be + exp 28 Si elastic scattering results. (Atomindex citation 11:561451)

ANU-P-755 PC **A03**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Three- and Five-Quasiparticle Isomers, Rotational Bands and Residual Interactions in exp 175 Hf.
G. D. Dracoulis, and P. M. Walker. Mar 80, 38p
U.S. Sales Only.

Two 3-quasiparticle isomers with spins, parities and half lives of 19/2 exp + , 1.1 mu and 23/2 exp - , 1.2 ns have been identified at 1433 and 1766 keV in exp 175 Hf. A third isomer possibly 35/2 exp - with a 1.2 mu s half-life is found at 3015 keV. The first two are

characterised as a 7/2 exp + (633) neutron coupled to the known 6 exp + and 8 exp - 2-proton isomers of the core nuclei. Rotational bands based on the 3-qp isomers are highly perturbed, due to Coriolis mixing, and their structure is reproduced in a band mixing calculation. The energy depression of the 3-quasiparticle states relative to the 2-quasiproton core states is attributed mainly to the residual proton-neutron interaction, and possibly also to blocking effects through neutron admixtures. (Atomindex citation 11:561452)

ANU-P-758 PC **A03**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Inelastic Scattering of exp 9 Be Projectiles to Low Lying Collective States in exp 28 Si and exp 40 Ca at E(exp 9 Be) = 45 and 60 MeV.
J. S. Eck, T. R. Ophel, P. D. Clark, D. C. Weisser, and G. R. Satchler. Mar 80, 28p
U.S. Sales Only.

Angular distributions for the excitation of the 1.78 MeV state in exp 28 Si and the 3.73 and 4.49 MeV states in exp 40 Ca by inelastic scattering of exp 9 Be have been measured at exp 9 Be bombarding energies of 45 and 60 MeV. DWBA calculations utilizing the same double folding potential model procedure which fitted the elastic scattering angular distributions for exp 9 Be + exp 28 Si and exp 9 Be + exp 40 Ca yielded a reasonable description of the inelastic angular distributions. The results are consistent with the elastic scattering analysis involving exp 9 Be projectiles but are anomalous in comparison to the scattering of heavier projectiles (A>=12) from the same target nuclei. It is shown that the inelastic cross sections are rather insensitive to the real coupling potential, being dominated by the imaginary part of the coupling. (Atomindex citation 11:561453)

ANU-P-759 PC **A02**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Static Quadrupole Moment of the First Excited State of exp 28 Si.
R. H. Spear, and M. P. Fewell. Feb 80, 18p
U.S. Sales Only.

The reorientation effect in Coulomb excitation has been used to measure the static quadrupole moment Qsub(2 exp +) and B(E2; 0 exp + implies 2 exp +) for the 1.779 - MeV first excited state of exp 28 Si. The results obtained are Qsub(2 exp +) = 15.5 +- 3.4 e fm exp 2 and B(E2; 0 exp + implies 2 exp +) = 326 +- 20 e exp 2 fm exp 4 . The value obtained for Qsub(2 exp +) confirms the results of other recent determinations using the reorientation effect, and the B(E2; 0 exp + implies 2 exp +) value is in excellent agreement with the mean value deduced from previus lifetime determinations. Shell-model and Hartree-Fock calculations of Qsub(2 exp +) both give a good account of the experimental result. (Atomindex citation 11:561454)

ANU-P-761 PC **A02**/MF **A01**
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Electric Quadrupole Excitation of the First Excited State of exp 11 B.
M. P. Fewell, R. H. Spear, T. H. Zabel, and A. M. Baxter. Feb 80, 10p
U.S. Sales Only.

The Coulomb excitation of backscattered exp 11 B projectiles has been used to measure the reduced E2 transition probability B(E2; 3/2 exp - implies 1/2 exp -) between the 3/2 exp - ground state and the 1/2 exp - first excited state of exp 11 B. It is found that B(E2; 3/2 exp - implies 1/2 exp -) = 2.1 +- 0.4 e exp 2 fm exp 4 , which agrees with shell-model predictions but is a factor of 10 larger than the prediction of the core-excitation model. (Atomindex citation 11:561455)

BONN-HE-80-10 PC **A02**/MF **A01**
Bonn Univ. (Germany, F.R.). Physikalisches Inst.
Representations and Clebsch-Gordan Coefficients of Z-Metacyclic Groups.
A. Bovier, M. Lueling, and D. Wyler. Jul 80, 25p
U.S. Sales Only.

We investigate finite groups of the form Zsub(n) SZsub(n) and give all irreducible representations and Clebsch-Gordan coefficients in analytic form. Two subclasses are considered which seem to be important for applications: the M-metacyclic groups, which are important for spin systems and the K-metacyclic groups which are the the smallest finite groups that have an irreducible representation of dimension p-1, where p is prime. (Atomindex citation 11:560305)

CBPF-A0040/79 PC **A02**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Consequences of Temporal and Axial Gauge Fixing.
R. P. Mondaini. Dec 79, 19p
U.S. Sales Only.

The role played by temporal (Asub(a) exp 0 = 0) and axial (Asub(a) exp 3 = 0) gauges in a non-abelian gauge theory, within the methods of Dirac's Hamiltonian formulation, is shown. The necessary equations of the theory are written and some solutions are presented. (Atomindex citation 12:619753)

CEA-CONF-5148 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Theorique.
Toward a Mean Field Theory of Spin Glasses: The TAP Route Revisited.
C. de Dominicis. Feb 80, 13p CONF-800254-3
Common trends in particle and condensed matter physics conference, Les Houches, France, 18 Feb 1980.
U.S. Sales Only.

After a sketchy derivation of TAP equations, we show first how one can recover two known results (Sherrington Kirkpatrick, and Sommers) by direct perturbation resommation a la Martin Siggia Rose. Going beyond perturbation, it is recalled that TAP equations can be reduced to a one site self consistent problem involving several order parameters. The existence of a large number of solutions to TAP equations at low T forces us to choose a weight to be attributed to each solution. Also we are forced to reintroduce replicas to compute averages over the ensemble of solutions. In contradistinction to what usually occurs it is argued that here replicas are rather innocent. The uniform (white) average and the microcanonical average are briefly discussed. (Atomindex citation 11:563185)

CEA-CONF-5190 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Theorique.
Generalized Non-Linear sigma-Models with Gauge Invariance.
J. Zinn-Justin. Sep 79, 17p CONF-7908137-1
Cargese summer institute: recent developments in gauge theories, Cargese, France, 27 Aug 1979.
U.S. Sales Only.

In these lectures we shall give a brief description of a family of models which generalize the non-linear sigma-model, and possess in addition a local gauge invariance without containing explicitly a gauge field. In the first section we shall review the well known properties of the non-linear sigma-model. In section II we characterize the largest class of boson field theories we know which have classically an infinite number of non local conserved currents. In section III we describe some properties of these theories as asymptotic freedom and non perturbative spectrum in two dimensions. (Atomindex citation 11:562874)

CEA-CONF-5214 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique Nucleaire.
Fast Fission Phenomena in Heavy Ion Reactions.
C. Gregoire, R. Lucas, C. Ngo, H. Ngo, and B. Schuermann. Apr 80, 2p CONF-800452-10(Sum.)
International conference on nuclear behavior at high angular momentum, Strassbourg, France, 22 Apr 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5216 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique des Particules Elementaires.
Amplitude Analysis in pi exp + N Implies pi exp + pi exp - p and K exp + N Implies K exp + pi exp - p Reactions at 6 GeV/C.
M. Svec. Mar 80, 22p CONF-800375-2
Workshop on low and intermediate energy kaon-nucleon physics, Rome, Italy, 24 Mar 1980.
U.S. Sales Only.

A model independent amplitude analysis is presented for reactions pi exp + n implies pi exp + pi exp - p and K exp + n implies K exp + pi exp - p at 6 GeV/c using the recent data obtained by the Saclay group in experiments on a transversely polarized deuteron target at CERN. Assuming that for dimeson invariant masses below 1 GeV only S- and P-waves contribute, we obtain two sets of solutions for 8 moduli and 4 relative phases of recoil nucleon transversity amplitudes. The S-wave contribution is found small in solution 1 but is relatively large in solution 2. Both solutions require presence of nucleon helicity nonflip amplitudes (dominated asymptotically by A sub 1 -exchange) with phases different from those of nucleon helicity flip amplitudes (dominated by pi -exchange). These experimental results contradict theoretical assumptions that the A sub 1 -exchange amplitudes are either zero or in phase with the pi -exchange dominated flip amplitudes. (Atomindex citation 11:567868)

CEA-CONF-5217 PC **A03**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique des Particules Elementaires.
Measurement of the Reactions K exp + N Implies K exp + pi exp - p and pi exp + N Implies pi exp + pi exp - p at 6 and 12 GeV/C on a Transversely Polarized Deuteron Target.
A. de Lesquen, M. Babou, and J. Bystricky. Mar 80, 26p CONF-800375-3
Workshop on low and intermediate energy kaon-nucleon physics, Rome, Italy, 24 Mar 1980.
U.S. Sales Only.

In an experiment carried out at the CERN-PS the reactions K exp + n implies K exp + pi exp - p and pi exp + n implies pi exp + pi exp - p have been measured at 6 and 12 GeV/c incident momentum using the CERN polarized deuteron target. Our data for invariant mass <=1 GeV of the produced dimeson-system, when analyzed in terms of S- and P-partial wave only, are sufficient to determine all moduli and at least four of the relative phases of the eight complex nucleon transversity amplitudes describing the reaction. (Atomindex citation 11:567869)

CEA-CONF-5253 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Nucleaire a Haute Energie.
Search for Dibaryonic Resonances around 2.23 GeV.
P. E. Argan, C. Audit, N. de Botton, J. L. Faure, and J. Martin. Jun 80, 1p CONF-8006212-1(Sum)
European symposium on few body problems, Sesimbra, Portugal, 3 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5254 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Nucleaire a Haute Energie.
Experimental Study of the pi exp +- Interaction with Protons and Deuterons at Low Energy.
B. Balestri, P. Y. Bertin, and B. Coupat. Jun 80, 1p CONF-8006212-2(Sum)
European symposium on few body problems, Sesimbra, Portugal, 3 Jun 1980.
U.S. Sales Only.

No abstract available.

CEA-CONF-5306 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Theorique.
Quark Fragmentation Models for Low-P(T) Multiparticle Production.
R. Peschanski. Jun 80, 20p CONF-8006108-6
11. international symposium on multiparticle dynamics, Bruges, Belgium, 22 Jun 1980.
U.S. Sales Only.

We review different quark fragmentation models of non-diffractive hadron-hadron scattering, relying on the production of valence quark jets in the forward-backward direction. Their common feature is a mechanism in which one valence quark is slowed down to the central region, the other taking almost all the available center-of-mass-momentum. This 'held-back' effect is well understood in terms of constituent quarks and the parton interpretation of Dual Topological Unitarization. This scheme, allowing parameter-free predictions may

lead to a systematic and theoretically constrained use of the Q.C.D. parton model in low-P(T) scattering. (Atomindex citation 12:576800)

CEA-CONF-5530 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Service de Physique Theorique.
Critical Behaviour from the Field Theoretical Renormalization Group Techniques.
E. Brezin. Jul 80, 18p CONF-8007120-1
1980 Cargese summer institute: phase transitions, Cargese, France, 16 Jul 1980.
U.S. Sales Only.

These few pages are nothing but a brief and incomplete survey of some of the ideas involved in the renormalization group approach. (Atomindex citation 12:614443)

CEA-N-2150 PC **A08**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Dept. de Physique des Particules Elementaires.
Study of Inclusive Semi-Leptonic Neutral Current Reactions in Neutrino and Antineutrino Interactions Between 12 and 200 GeV.
B. Devaux. Sep 80, 170p
In French.Thesis.
U.S. Sales Only.

We report here the results obtained in a detailed study of neutral current type reactions: antineutrino + Fe implies antineutrino + X using the CERN-DORTMUND-HEIDELBERG-SACLAY collaboration detector and a Narrow Band Neutrino Beam of the SPS at CERN. The detector and beam properties lead to a good knowledge of the resolution and contamination sources. Between 12 and 200 GeV, the ratio of the inclusive cross-sections of neutral to charged current reactions is measured to be: Rsub(neutrino)=0.293+-0.010 and Rsub(antineutrino)=0.35+-0.03. Within the experimental errors, there is no significant variation of those ratios with the incoming meutrino energy. The space-time structure of neutral current is dominated by the (V-A) component with a non-zero (V+A) term, up to 4.5 standard deviations. Following Weinberg and Salam model, all results are consistent for a value of sin exp 2 theta(W)=0.24+-0.02. Because of the accuracy, it becomes a reference value for that quantity. (Atomindex citation 12:576888)

CEA-R-5052 PC **A07**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Office des Rayonnements Ionisants.
Investigations About the Internal Conversion Coefficient for Transition Energies Near the Threshold.
N. Farany Coursol. Jun 80, 140p
In French.Thesis.
U.S. Sales Only.

The first part of this paper is devoted to a detailed review of the different theories concerning the internal conversion. The principal physical parameters and their influence on the calculated conversion coefficients are presented. The results (experimental and theoretical) obtained for the internal conversion coefficients near the threshold (K sheil) for the transitions in the nuclei exp 57 Fe (M1; 14 keV), Sup(125m)Te (M1; 35keV), sup(129m)Xe (M4; 39 keV) and sup(93m)Nb (M4; 30 keV) are presented with the ICC computations for different types of transitions on the 30 and 80 atomic number nuclei. A comparison is made of the different computations and a discussion points out the penetration effect and hole correction which become important at low energy and for high multipolarities. (Atomindex citation 11:567978)

CENBG-8004 PC **A02**/MF **A01**
Bordeaux-1 Univ., Gradignan (France). Centre d'Etudes Nucleaires.
Role of Three-Body Coulomb Fields Versus Final State Interactions in the Decay of exp 12 C- alpha - exp 12 C.
J. L. Quebert, D. Bertault, J. N. Scheurer, and J. P. Fouan. 1980, 13p CONF-800232-6
International conference on extreme states in nuclear systems, Dresden, German Democratic Republic, 4 Feb 1980.
U.S. Sales Only.

The alpha emission in exp 16 O + exp 12 C implies exp 12 C + alpha + exp 12 C has been thoroughly studied in the region of the rapidity plot: Ysub(alpha)=Ysub(c.m.). The three-body coulomb fields, as well as configurations close to alignment, account for the alpha yield which is observed. The apparent competition between direct and sequential decays is well explained by the coulomb break-up. (Atomindex citation 11:568389)

CENBG-8007 PC **A02**/MF **A01**
Bordeaux-1 Univ., Gradignan (France). Centre d'Etudes Nucleaires.
Secondary Reactions as a Tool to Produce Exotic Nuclei.
J. P. Dufour, A. Fleury, and R. Bimbot. 1980, 18p
U.S. Sales Only.

The possibility of using secondary reactions as tool to produce new isotopes is considered. This question is renewed with the emergence of intense beams of energetic heavy ions in the range of 20 to 100 MeV/nucleon. Three different methods are considered. They involve either the 'in situ' production of a secondary radioactive target, which interacts with the primary beam, or the production of a radioactive secondary beam by an inverse fusion or a fragmentation process. Very heavy or very neutron deficient isotopes can be produced by these methods. (Atomindex citation 11:568390)

CENBG-8015 PC **A02**/MF **A01**
Bordeaux-1 Univ., Gradignan (France). Centre d'Etudes Nucleaires.
Calculations of the Continuum gamma -Ray Spectra in (HI,Xn) Reactions.
P. Hubert, F. Leccia, R. Liotta, P. Mennrath, and M. M. Villard. Apr 80, 6p CONF-800452-11
International conference on nuclear behavior at high angular momentum, Strassbourg, France, 22 Apr 1980.
U.S. Sales Only.

Calculations of the continumm gamma -ray spectra following particle evaporation in (HI,xn) reactions have been performed for deformed and spherical nuclei with A approximately 150. Good agreement with various experiments is obtained when choosing an adequate structure of the yrast line, and when allowing for an M1 to E2 competition in the gamma de-excitation of the nucleus. (Atomindex citation 11:568391)

CRN-HE-79-16 PC **A07**/MF **A01**
Strasbourg-1 Univ. (France). Centre de Recherches Nucleaires.
Study of Charged Multiplicities and Double Scattering in Anti Pd Interactions Between 3 and 15 GeV/C Incident Momentum. General Aspects of Annihilation Reactions.
These (D. es S.),
M. Michalon-Mentzer. 1979, 132p
In French.
U.S. Sales Only.

From a study of the charged multiplicity distributions, antipd and antipn interactions in the range of incident momentum going from 3 to 15 GeV/c have been analysed. The antipd and antipn topological cross sections have been calculated. The behavior of the different statistical moments obtained from the charged multiplicities as function of the incident momentum have been studied. We have analysed rescattering phenomena inside the deuteron and the rescattering fraction per antipd collisions was found to be of the order of 20%. Data are in good agreement with the predictions of the energy flux cascade model and the coherent tube model. General features of the antipn annihilation processes have been also studied in particular by means of collective variables like sphericity and thrust which describe jets properties or alignment effects of interactions. (Atomindex citation 11:561257)

CRN-PN-79-20 PC **A02**/MF **A01**
Strasbourg-1 Univ. (France). Centre de Recherches Nucleaires.
Radiative Capture of Tritons by exp 14 N and exp 17 O Levels Above 19 MeV.
I. Linck, L. Kraus, and S. L. Blatt. 1979, 25p
U.S. Sales Only.

Cross sections for the radiative capture of tritons by exp 14 N have been measured in the incident energy range 0.8 to 3.3 MeV and found to be of order 200-300nb/sr. The 90 exp 0 excitation functions exhibit resonant structures for the transitions to the 5/2 exp + ground state of exp 17 O and the 1/2 exp + (0.87-MeV) first excited state. Multilevel S-matrix fits of both excitation functions and angular distributions, on the assumption that dipole transitions dominate, permit J/sup pi / assignments for the observed resonances to be limited to a very few possibilities; the best fit results, which are also most consistent with other relevant arguments, give the most likely assignments 3/2 exp - , 5/2 exp - , 1 /2 exp + , 3/2 exp - , for states at 19.76, 20.39, 20.58 and 21.05 MeV respectively, although the parities cannot be individually ascertained. The lower limit for the radiative widths GAMMA/sub gamma / ranges from 1 to 6 eV. An additional level also appears to be present at approximately 19.3 MeV. (Atomindex citation 11:564179)

DAMTP-80/7 PC **A02**/MF **A01**
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
Possibility of Magnetic Monopoles Lighter Than 1/ alpha Msub(X) in Grand Unified Theories.
D. M. Scott. Apr 80, 3p
U.S. Sales Only.

It is argued that in special cases monopoles may have masses significantly less than 1/ alpha Msub(x) where Msub(x) is the mass of the heaviest vector boson in the grand unified theory under consideration. (Atomindex citation 12:602739)

DESY-80/61 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
New Results on the UPSILON-System from DORIS.
H. Schroeder. Jun 80, 8p
U.S. Sales Only.

Further studies of e exp + e exp - annihilations in the UPSILON region at the DESY storage ring DORIS have yielded improved results on the properties of the UPSILON mesons. For the UPSILON-meson the leptonic width GAMMAsub(ee) and branching ratios Bsub(mu mu) are found to be GAMMAsub(ee) = 1.29 +- 0.07 keV and Bsub(mu mu) = 3.2 +- 0.8 %. This gives a total width of the UPSILON-meson of GAMMAsub(tot) = 40 exp +13 sub(-8) keV. The leptonic width of the UPSILON'meson was determined to GAMMA sub(ee)(UPSILON') = 0.57 +- 0.06 keV. The UPSILON mesons are by now well established. They represent quarkonium states of the heavy quark b and its antiquark. From the leptonic width of the UPSILON mesons the charge of the b quark was found to be esub(b) = -1/3. The mass spectrum is well known up to the UPSILON"' mass just above the flavor threshold. It has been shown that the UPSILON decay pattern can be understood by assuming that it consists mainly of decays into 3 gluons. (Atomindex citation 11:561258)

DESY-80/62 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Experimental Limits on the Lowest Possible Mass Horizontal Gauge Boson in SU(2)sub(H).
I. Montvay. Jul 80, 11p
U.S. Sales Only.

Experimental limits coming from mu -, tau- and K-decays are evaluated for the gauge boson mediating SU(2)sub(H) horizontal interactions and acting mainly (that is, apart from small mixing angles) between the second and third fermion generations. (Atomindex citation 11:561121)

DESY-80/63 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
How Thick Are Chromoelectric Flux Tubes.
M. Luescher, G. Muenster, and P. Weisz. Jul 80, 12p
U.S. Sales Only.

We analyse the space dependence of the expectation value of the chromoelectric energy density in the presence of a static quark anti-quark pair by means of the strong coupling expansion on a lattice and by the relativistic string model. Both methods indicate that the transversal width of the field energy distribution increases without bound, when the quark anti-qark separation goes to infinity. (Atomindex citation 11:561122)

DESY-80/65 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Grand Unification at the Subcomponent Level.
I. Montvay. Jul 80, 8p

U.S. Sales Only.

The Casalbuoni-Gatto subcomponent model of quarks and leptons is generalized allowing for an arbitrary number of subcomponents. It is shown that there are only a limited number of cases when the subcolour can be embedded in a semi-simple grand unification scheme. The most interesting models lead to an SU(7) x SU(7) grand unification at the subcomponent level. In one of them there is a natural place also for a hypercolour (technicolour) group SU(2)sub. (Atomindex citation 11:561123)

DESY-80/66 PC **A03**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Distributions in the Process E exp + E exp - implies mu exp + mu exp - (Gamma).
F. A. Berends, and R. Kleiss. Jul 80, 26p
U.S. Sales Only.

Analytical expressions for a number of distributions in the process e exp + e exp - implies mu exp + mu exp - (gamma) are given. A procedure is outlined to simulate events for this reaction by using the analytical distributions. This method then provides numerically any other distribution and makes it possible to impose any experimental constraint to radiative correction calculations. Besides examples for pure QED situations, also the corrections to R and to the thrust distribution for hadronic events are discussed. (Atomindex citation 11:561124)

DESY-80/69 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Multiplicity Distributions in E exp + E exp - Annihilations at PETRA Energies.
C. Berger, H. Genzel, R. Grigull, W. Lackas, and F. Raupach. Jul 80, 8p
U.S. Sales Only.

Measurements of the charged multiplicities for hadron production in e exp + e exp - annihilation in the center of mass energy range 9-32 GeV have been made. The average charged multiplicity has an energy dependence much stronger than in s and similar to that reported for pp collisions. Quantitative differences are observed in the magnitudes of both the average multiplicity <nsub(ch)> and the dispersion Dsub(ch) for e exp + e exp - and pp interactions at the same center of mass energy. <nsub(ch)> and the ratio <nsub(ch)>/Dsub(ch) in e exp + e exp - annihilations are significantly larger than in pp collisions and are found in overall agreement with QCD predictions. KNO scaling is seen to be satisfied. (Atomindex citation 11:561259)

DESY-80/70 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Total Hadronic Cross Section, Multiplicity and Inclusive Particle Spectra from E exp + E exp - Annihilation at PETRA.
U. Timm. Jul 80, 12p CONF-8005125-2
Conference on environmental regulation of the nuclear industry: a new decade, San Francisco, CA, USA, 18 May 1980.
U.S. Sales Only.

The total hadronic annihilation cross section has been measured by four experiments in the range 12.0 <= sqrt s <= 35.8 GeV. There is no evidence for production of a sixth quark (top). The chances to measure the strong coupling constants alpha sub(s) in this channel are discussed. Charged multiplicities from three experiments show a rapid rise with energy above the ln s-dependence observed for CMS energies below 10 GeV. The data are in good agreement with the multiplicities observed in hadronic collisions and confirm the scale breaking expected from hard gluon emission (q anti qg) in e exp + e exp - -annihilation. In detail, there are differences to the multiplicities from pp. The inclusive spectra display scaling for x > 0.2 up to sqrt s = 35.8 GeV within the experimental errors, but the accuracy is not sufficient to show the predicted violation of scaling (approx. 10% of the slope). (Atomindex citation 11:561260)

DESY-80/71 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Search for Fractional Charge and Heavy Stable Particles at PETRA.
W. Bartel, T. Canzler, D. Cords, P. Dittmann, and R. Eichler. Jul 80, 15p
U.S. Sales Only.

A search has been made for new particles with charge Q = 2/3, 1, 4/3, 5/3 produced in e exp + e exp - - reactions at PETRA. The energy range was Esub(cm) = 27-35 GeV. No such particles were found. Upper limits for the cross-section depending on the assumed mass and production spectrum are given. For Q = 2/3 quarks with mass less than 12 GeV/c exp 2 , upper limits sigma(q anti q)/sigma(mu mu) <= 10 exp -2 (90% C.L.) are obtained both for inclusive and exclusive production. For the lifetime of the B-meson (msub(B) = 5 GeV/c exp 2) an upper limit tau <= 2 x 10 exp -9 s is obtained. (Atomindex citation 11:561261)

DESY-80/73 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Initial State Radiation for E exp + E exp - Annihilation into Jets.
F. A. Berends, and R. Kleiss. Jul 80, 7p
U.S. Sales Only.

A method is described which enables one to take into account initial state radiation to the process e exp + e exp - implies hadrons. It treats exactly both the photon emission and the angular distribution of the produced particles, once this angular distribution is given for the non-bremsstrahlung case. The method is such that it can easily be used in conjunction with any Monte Carlo program for the production of hadrons. (Atomindex citation 11:561125)

DESY-80/74 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Roughening Transition in Abelian Lattice Gauge Theories.
G. Muenster, and P. Weisz. Jul 80, 9p
U.S. Sales Only.

We study the width of the confining string between static quarks in Abelian lattice gauge theories using strong coupling expansions. We consider gauge groups Zsub(n) and U(1) in 3 and 4 dimensions. This extends previous work with Luescher, where SU(2) and Z sub 2 were studied. In nu = 3 dimensions we find evidence for a roughening transition. It is characterized by a divergence of the string width for an infinitely far separated quark antiquark pair, while the string tension remains non-zero. In nu = 4 dimensions for the Abelian groups we do not have evidence for a roughening transition away from a phase transition. (Atomindex citation 11:560308)

DESY-80/77 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Rho rho Production by Two Photon Scattering.
R. Brandelik, W. Braunschweig, K. Gather, V. Kadansky, and K. Luebelsmeyer. Jul 80, 6p
U.S. Sales Only.

We present the first observation of the reaction gamma gamma implies rho exp 0 rho exp 0 . The data were obtained in a study of e exp + e exp - scattering at beam energies between 15 and 18.3 GeV. The measured cross section values near threshold exceed the Pomeron contribution calculated in the vector meson dominance model by a large factor. (Atomindex citation 11:561262)

DESY-80/91 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Order alpha exp 2 sub(S) Correction to Jet Cross Sections in E exp + E exp - Annihilation.
K. Fabricius, I. Schmitt, G. Schierholz, and G. Kramer. Sep 80, 17p
U.S. Sales Only.

We calculate the Sterman-Weinberg type cross section for three jets and the 0(alpha exp 2 sub(s)) correction to the thrust distribution 1/sigma dsigma/dT. The effect on 1/sigma dsigma/dT is sizable (in the anti MS scheme) but not in conflict with the expected convergence of the perturbation series. (Atomindex citation 12:579847)

DE81903965 PC **A02**/MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).

Neutron Scattering from exp 206 exp 207 exp 208 Pb and exp 209 Bi in the Energy Range 7.5 to 13.5 MeV.
G. Haouat, O. Bersillon, J. Lachkar, Y. Patin, and C. Lagrange. Apr 81, 13p CEA-N-2200, NEANDC(E)-218(L), INDC(FR)---45/L
In French.
U.S. Sales Only.

In order to study the neutron-nucleus interaction for nuclei in the mass region around A = 208, neutron elastic and inelastic cross-sections of exp 206 exp 207 " exp 08 Pb and exp 209 Bi have been measured at 7.5, 9.5, 11.5 and 13.5 MeV incident energies. A preliminary analysis of the data has been undertaken. Spherical optical potential parameters have been deduced from both the present elastic scattering data and the energy variation of the total cross-section over a wide range. These parameters were then used for calculating inelastic scattering cross sections for collective excited states within the framework of the DWBA formalism. (ERA citation 07:006144)

DE82002861 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Bandmixing and the IBA.
R. F. Casten, and D. D. Warner. 1981, 12p BNL-30176, CONF-810920-19
Contract AC02-76CH00016
International symposium on neutron-capture gamma-ray spectroscopy and related topics, Grenoble, France, 7 Sep 1981.

The structure of the IBA in deformed nuclei, both for the SU(3) limit and in a realistic case (exp 168 Er), is studied in the context of the geometrical model with bandmixing. The following principal conclusions emerge. The IBA characteristically predicts strong beta ' implies gamma ' band E2 transitions which dominate beta implies g transitions in agreement with existing data. The beta ' implies gamma ' transitions arise in the IBA from both a mixing term and a direct delta K = 2 matrix element and, in fact, the latter dominates. From a Mikhailov plot formalism, the data, for exp 168 Er, give explicit evidence for the existence of a dominant direct matrix element as well. In a bandmixing context, the traditional collective model can also yield dominant beta implies gamma transitions, and for values of the mixing parameter Z/sub beta gamma / consistent with other evidence. However, the predicted branching ratios are independent of Z/sub beta gamma / and disagree with the data. This can be rectified only by the ad hoc introduction of a direct delta K = 2 matrix element which, in principle, should be forbidden in the limit of harmonic vibrations. (ERA citation 07:006130)

EFI-381(39)-79 PC **A03**/MF **A01**
Erevanskii Fizicheskii Inst. (USSR).
Amplitude Analysis of pi N Scattering in Impact Parameter Representation.
Sh. S. Erenyan, and G. N. Khachatryan. 1979, 39p
U.S. Sales Only. Microfiche only after original copies are exhausted.

A complete amplitude analysis of experimental data on pi N scattering in (S,t) and (S,b) representations in the energy interval from 6 to 200 GeV is carried out. It is shown that in pi N scattering at superhigh energies a non-zero polarization of final nucleon independent on the incident pion energy and sign must exist. Profile function of pi N scattering resembles that of a scattering of a "grey ball" whose transparency and radius first increase as the energy grows, and then become constant. The mean-square radius at high-energy interaction is almost constant and is equal to 0.75 fermi. A shell structure of pi N scattering at 6 GeV is found. (Atomindex citation 11:567721)

EUR-6929 PC **A23**/MF **A01**
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
Proceedings of the Second Technical Meeting on the Nuclear Transmutation of Actinides, Ispra, 21-24 April 1980.
W. Hage. 1980, 537p CONF-800444-
Technical meeting on the nuclear transmutation of actinides, Ispra, Italy, 21 Apr 1980.
U.S. Sales Only.

Separate abstracts are presented for each of the conference papers included in the data base. (ERA citation 07:006167)

FEI-1005 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Estimation of the Capture Cross Section and Its Resonance Self-Shielding for U-238 from the Analysis of Experiments on Neutron Transmission in the Range of Unresolved Resonances.
A. A. Van'kov, A. M. Tsibulya, and C. K. Maj. 1980, 13p
In Russian.
U.S. Sales Only.

On the basis of analysis of experimental data on neutron transmission through exp 238 U specimens the averagegroup neutron capture cross sections have been evaluated with and without account of resonance self-shielding. The data were obtained elsewhere both in the back spherical geometry by the time-of-flight method in the neutron energy range E/sub n/ < 100 keV, and in the good geometry by the self-iodication method (10 <= E/sub n/ < 80 keV). Thus evaluated data are compared to those calculated with the help of the BNAB-M, BNAB-70 and BNAB-78 libraries. Significant discrapancies in the resonance self-shielding factors of the exp 238 U capture cross sections are observed in the range of unresolved resonances. (Atomindex citation 11:564181)

FEI-925 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Dependence of Heavy Nucleus Fission Probability on Nucleon Composition. Pt. 2. Systematics of Fission Barrier and Relations.
V. M. Kupriyanov, K. K. Istekov, B. I. Fursov, and G. N. Smirenkin. 1979, 18p
In Russian.
U.S. Sales Only.

In the framework of the phenomenological model the most important characteristics of the fission probability for heavy nuclei with Z >= 92: the peak heights of a two-peak barrier and ratios of the average neutron and fission widths Gsub(n)/Gsub(f) depending on the nucleon composition. Simple relations obtained permit to predict these values outside the maximum stability region in which the experimental data are concentrated. The discrepancy of the calculation data with the traditional purely empirical systematics attains one order and higher. The Gsub(n)/Gsub(f) description obtained is an advance over those phenomenological approaches, which have regarded for the shell effects only in the around state. (Atomindex citation 11:567982)

FEI-970 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Energy Spectra of Prompt Fission Neutrons Emitted at Different Angles Relative to the Fragment Motion Direction.
G. M. Akhmedov, and V. S. Stavinskii. 1979, 13p
In Russian.
U.S. Sales Only.

The spectra of prompt neutrons in the fission of Cf exp 252 , emitted at different angles respective to the fragment flight direction, are calculated and compared with the experimental data. Calculations are based on the spectrum in the fragment center-of-mass system, which was derived previously in the framewwork of the Weiskopf statistical theory with allowance for cascade mechanism of neutron emission and fragment excitation energy dispersion. The laboratory-frame spectra of neutrons were calculated under the following assumptions: 1) neutrons are emitted after an acceleration of fragments is completed, 2) the c.m.s. distribution of neutrons is isotropic, 3) the laboratory-frame spectrum of fission neutrons, emitted at a given angle respective to the direction of flight of heavy and light fragments is a sum of spectra for the most-probable light and heavy fragments. Possible sources of discrepancies between the results of calculations and the experimental data are discussed. (Atomindex citation 12:603895)

HU-P-178 PC **A04**/MF **A01**
Helsinki Univ. (Finland). Dept. of High Energy Physics.
Vector Meson Production in Pp, Anti Pp, pi exp +- p and K exp +- p Collisions and Comparison with the Quark Fusion Model.
R. Kinnunen. Jan 80, 61p
U.S. Sales Only.

Inclusive spectra and yields of vector mesons in pp, anti pp, pi exp +- p and K exp +- p interactions are discussed in terms of parton model. Predictions of the quark fusion model, which uses a Drell-Yan type mechanism, are compared with the experimental data. Special attention is given to the production of phi meson. The Zweig rule violating processes are explained as annihilation of nonstrange valence quarks and described by an extension of the model. (Atomindex citation 11:561126)

HU-TFT-80-24 PC **A03**/MF **A01**
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Correcting the Kink Gas Double Counting by an Effective Potential.
J. Hietarinta, and D. Nemeschansky. 1980, 33p
U.S. Sales Only.

We show how to improve the dilute gas expansion by including terms that correct double counting errors. The 1D double-well system is studied in detail. The effective correction potential diverges as the kink-antikink distance goes to zero and in this way provides a repulsive core to cut off the kink-gas density. Comparisons with the kink mass give limits to the applicability of the uncorrected kink gas. (Atomindex citation 12:602742)

HU-TFT-80-29 PC **A02**/MF **A01**
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Perturbation Methods for the (Almost) Zero-Modes and the Green Function in an Instanton Gas Background.
J. Hietarinta, and D. Nemeschansky. 1980, 17p
U.S. Sales Only.

We formulate an approximation method which can be used to compute the almost zero modes and the generalized Green function in the background of an approximate instanton gas solution. The main problem of choosing the starting point is solved by requiring that the 0th-order operator H sub 0 annihilates the original isolated single-instanton zero modes. The 0th-order approximation to H sub 0-1 , on the other hand, is constructed from the free Green function with local bumbs proviced by the one-instanton Green function. (Atomindex citation 12:602743)

HU-TFT-80-5(Rev.) PC **A02**/MF **A01**
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Test of Einstein Locality.
M. Roos. Nov 80, 12p
U.S. Sales Only.

Einstein locality imples that spacelike separated coherent quantum systems do not interfere, and that all interferences must propagate with at most the speed of light. It then follows that the reaction e exp + e exp - implies K exp 0 antiK exp 0 must yield some Ksub(s)Ksuu(s) decays in apparent violation of P and C conservation. (Atomindex citation 12:603716)

IA-1333 PC **A04**/MF **A01**
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
Heavy Isotopes of Krypton and Xenon in Thermal Neutron Induced Fission of exp 235 U.
Thesis (Ph.D.),
H. Feldstein. Jul 79, 64p
In Hebrew.
U.S. Sales Only.

Krypton and xenon isotopes, produced in the thermal neutron fission of exp 235 U, were investigated by electromagnetic separation of chemically pure noble gases emanating from a uranium oxide-barium stearate target and introduced into an on-line mass-separator, the SOLIS. The separated isotopes were beta counted and the transfer function and half lives of the separated isotope and its precursor in the target were calculated. Two new isotopes exp 93 Kr and exp 143 Xe were detected and characterized by their half lives (0.2 + 0.02 and 0.3 + 0.03 sec, respectively). In gamma ray measurements, the prominent gamma peaks of exp 93 Kr and exp 93 Rb were identified and their relative intensities calculated. Relative, independent fission yields of the heavy isotopes of Kr and Xe were obtained by analyzing the beta decay curves obtained at similar operating conditions. For the lighter isotopes, e.g. exp 87 Kr, exp 139 Xe, absolute yields were obtained by calculating the ratio of cumulative yields of the halogen precursor to the independent yield of the noble gas, from curves describing the growth of beta activity as a function of irradiation time. The fission yields obtained in this work are symmetrically higher than those predicted by the normal Gaussian distribution suggested by Wahl. Since both Kr and Xe have even numbers of protons, it was suggested that the high yields are due to preservation of proton pairs in the fission of the even Z nucleus. Comparison of other published fission yields with the "normal" distribution showed an average enhancement of 22(+-7)% in the yields of even Z nuclei with a corresponding decrease in the yields of odd Z nuclei. (Atomindex citation 11:561463)

IAE-3164 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Relation of Shell Structure of Fissile Nuclei to Half-Life of Spontaneous Fission and Fragment Mass Distribution.
V. P. Zakharova. 1979, 4p
In Russian.
U.S. Sales Only.

A hypothesis is proposed, according to which the fission of nuclear matter at the initial stage of nucleus fission occurs in such a way which preserves in the producing fragments the type of shell structure common to the initial nucleus. It follows from the hypothesis, that the hypotetic superheavy nuclei constituting "stability region" near the closed spherical shells z=114, N=184, should fission mainly to dence fragments with 208-210 and 88-90 masses, resulted from the proximity of spherical shells z=82, N=126 and z=28 (or 32), N=50. (Atomindex citation 11:567983)

IAE-3241/1 PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Study on the pi p and pi pi Interactions in the 2-Prong Events of the pi exp + p Reaction at Psub(Pi Sup(+))=3.05 GeV/C.
E. A. Alekseeva, A. A. Kartamyshev, V. K. Makar'in, K. N. Mukhin, and O. O. Patarakin. 1980, 43p
In Russian.
U.S. Sales Only.

The results of total and differential cross sections of 2-prong event production in pi exp + p interactions at psub(pi sup(+))=3.05 GeV/c are presented. The following reaction channels (pi sup(+)p implies pi sup(+)p)sub(el), pi exp + p implies pi exp + pi exp + n and pi exp + p implies pi exp + pi exp 0 p were identified in 5615, 2523 and 3108 interactions, respectively, from the analysis of almost 84000 stereophotographs obtained using the 50 cm hydrogen bubble chamber. Cross sections of the reactions are obtained: sigmasub(el)=7.02+-0.23 mb, sigma(pi exp + pi exp + n)=2.18+-0.16 mb and sigma(pi exp + pi exp 0 p)=3.26+-0.24 mb. Total and differential cross sections of rho exp + - and delta exp ++ -resonance productions are presented. Cross sections of elastic (pi exp + pi exp +)- and (pi exp + pi exp 0) scatterings in the range of dipion masses of 0.28 <=msub(pi pi)< =1.20 GeV and averaged spherical harmonics of <Ysub(L)sup(0)> are calculated using the method of extrapolation in pseudoperipherical approximation. Phases of S sub 2 -, D sub 2 - and P sub 1 - waves as functions of dipion mass are found out using both energy-dependent and energy-independent methods. The scattering lengths are determined: asub(0)sup(2) =(-0.07+-0.03)sub(mu)sup(-1); a sub 22 (3.8+-1.4)x10 exp -4 mu exp -5 . (Atomindex citation 12:603840)

IAE-3249/2 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Hydrodynamic Model of Highly Excited Nuclei.
V. M. Galitskii, and L. M. Satarov. 1980, 24p
In Russian.
U.S. Sales Only.

Decay of heavy nuclei excited in the process of collision with relativistic ions is considered in the hydrodynamic approximation. It is shown that the nuclei decay is similar to the process of nucleon gas expansion into vacuum at excitation energies of epsilon sub(b) > or approximately 30 MeV/nucleon using the equation of state of nuclear matter. Presented are the results of the numerical calculation of nucleon spectra emerging during the plumbum nuclei decay initiated by a collision with light relativistic nucleus in the range of excited energy values form 30 to 70 MeV/nucleon. Criteria of

application and accuracy of hydrodynamic description of the excited-nucleus decay process are under consideration. (Atomindex citation 12:603896)

IAEA-TECDOC-232 PC **A18**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Transactinium Isotope Nuclear Data-1979.
May 80, 410p CONF-790533-
IAEA Advisory Group meeting on transactinium isotope nuclear data, Cadarache, France, 2 May 1979.
U.S. Sales Only.

Separate abstracts are presented for each of the conference papers included in the data base. (ERA citation 07:006170)

IFVE-OEIPK-79-182 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Study of the Structure of Events with the Multiparticle Diffraction Dissociation in K exp - p Exclusive Reactions at 32 GeV/C.
Yu. I. Arestov, M. Yu. Bogolyubskii, and M. S. Levitskii. 1979, 15p
In Russian.
U.S. Sales Only.

The events with single- and double-vertex diffractive dissociation were separated by the method of maximal rapidity gap from K exp - pi exp + pi exp - p and K exp - 2 pi exp + 2 pi exp - p in K exp - p experiment with a sensitivity of 6 ev/ mu b. Distributions by rapidity to the cosine of Jackson angle for K exp - -meson in the equilibrium system of the diffractive system point out the absence of the leading K exp - -meson, but in the corresponding distributions for the proton an expressive effect of the leading particle is observed. Data on charge and strangeness exchange are in a good agreement with calculation results by the Monte-Carlo method in the supposition of the diffractive system statistical decay. (Atomindex citation 11:567884)

IFVE-OEIPK-79-183 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Analysis of Exclusive K exp - p Interactions at 32 GeV/C in Terms of Multiparticle Variables.
M. Yu. Bogolyubskii, S. A. Gumenyuk, and M. S. Levitskii. 1979, 24p
In Russian.
U.S. Sales Only.

A study of the exclusive channels in K exp - p-interactions at 32 GeV/c is fulfilled in terms of multiparticle variables. The general features of their final state phase space configuration with number of charged particles from 4 up to 10 can be described in the first approximation by a cylindrical phase space model, including a leading particle effect. The analysis indicates the decrease of peripherality of the reactions with multiplicity growth. It is found that events with nondiffractively produced light resonances in the channel K exp - p implies K exp - p pi exp + pi exp - give significant contribution to the transverse plane alignment and planarity effects; the relative alongation of event configurations along principle axis increases with energy, while planarity demonstrates approximate scaling for the final states with six and more particles. (Atomindex citation 11:567885)

IFVE-OEIPK-80-122 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Measurement of the Kaon Structure Function.
V. V. Knyazev, A. K. Likhoded, V. A. Uvarov, P. V. Shlyapnikov, and E. A. De Vol'f. 1980, 12p
In Russian.
U.S. Sales Only.

The first measurement of the kaon structure function is performed using the data on vector meson production in K exp + p interactions at 32 GeV/c. It is shown that inclusive spectra of the Ksup(*0+)(892), K exp 0 (prompt) and PHI, on the one hand, and rho exp 0 , on the other, determine the shape of Feynman variable x-distributions of the valence anti s and u quarks, respectively, in the incident kaon, which are very close to the quark-fusion model predictions and the theoretical expectations for high-energy processes. (Atomindex citation 12:603717)

IFVE-OEIPK-80-36 PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Inclusive Production of rho exp 0 - and phi-Mesons in the K exp + p Interactions at 32 GeV/C.
A. P. Vorob'ev, L. N. Gerdyukov, and V. V. Knyazev. 1980, 28p SERP-E-78
In Russian.
U.S. Sales Only.

Inclusive rhosup(o) and phi production has been measured in K exp + p interactions at 32 GeV/c. Total and semi-inclusive cross sections, longitudinal and transverse momentum distributions, including <psUb(T)> vs, x dependence, for rho sup(o) and phi are presented. No evidence for "a sea-gull" effect is observed. Comparison with quark models strongly suggests the possibility that a large components of rhosup(o) and phi vector mesons are produced as fragmentation products of the incident particles. (Atomindex citation 12:603841)

IFVE-OEIPK-80-95 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Delta exp ++ (1232)-Contribution to the Anti Pp Impiles p + X Reaction in the Region of Triple Regge Analysis.
B. Khanumaya, L. I. Sarycheva, and Yu. I. Arestov. 1980, 15p SERP-E-122
In Russian.
U.S. Sales Only.

The delta delta exp ++ - resonances contribution to invariant X-distributions of protons in the inclusive reaction anti pp implies delta exp ++ +X in the range of triple Regge analysis at 32, 70, 100 and 400 GeV/s is determined. Inclussive structural functions f delta (X) for delta exp ++ (1232)-resonance are calculated. The proton structural functions fsub(p(delta))(X) formed as a result of delta exp ++ decompositions are obtained. They are rather flattened and reach the maximum in the range of X approximately -0.8 - -0.6. The inclusive structural functions of "direct" protons as the difference fsub(p)sup(dir)(X)=fsub(p)(X)-14/9fsub(p(delta))(X) are determined. (Atomindex citation 12:603842)

IFVE-ONF-79-158 PC **A99**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Preliminary Results on Deep Inelastic Antineutrino-Nucleon Interactions at 2-25 GeV in SKAT.
V. M. Korablev, V. A. Korotkov, and E. P. Kuznetsov. 1979, 601p SERP-E-107
U.S. Sales Only.

The results of the analysis of the experimental data on deep inelastic antineutrino-nucleon interactions anti nu sub(mu) + N implies mu exp + + X are presented. Distributions over scaling variables are obtained. The dependence of the mean 4-momentum transfer squared on energy is determined. It is concluded that within the statistics there is a qualitative agreement of the experimental data on deep inelastic interactions with predictions of the naive quark-parton model. (Atomindex citation 11:567886)

IFVE-ONF-79-174 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Production and Decays of Heavy Leptons in nu sub(Mu)(Anti nu sub(Mu))N Interactions.
V. I. Konyushko, A. A. Sokolov, Yu. P. Nikitin, and S. G. Rubin. 1979, 24p SERP-E-107
In Russian.
U.S. Sales Only.

Leptonic and semileptonic decays of heavy leptons produced in nu sub(mu)N and anti nu sub(mu)N interactions are considered. General expressions for differential cross sections of these processes are obtained under the assumption, that weak currents have V, A arbitrary space-time structure. Kinematical peculiarities of decay particle spectra, the account of which makes easier the search of heavy lepton and allows one to define its mass, are considered. The numerical differential cross section calculations, the results of which confirm the existence of the above peculiarities, are carried out. (Atomindex citation 12:603718)

IFVE-OTF-79-166 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Fast Hadron Production in Parton Model.
V. G. Kartvelishvili, A. K. Likhoded, and A. N. Tolstenkov. 1979, 15p
U.S. Sales Only.

The problem of inclusive fast hadron production with small transverse momentum in the framework of the parton model is considered. It is shown that at the proper account for the parton momentum conservation law the fast hadron spectrum always reproduces valence quark distribution independently of a special choice for the recombination function. A recombination function, which takes into account quantum numbers of the produced hadron and short-range of partons in the rapidity space is proposed. There is no difference between functions for quark recombination of identical quark content. This fact is caused by neglecting the spin-spin interaction of quarks in hadrons. (Atomindex citation 11:567725)

IFVE-OTF-80-120 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Particle in a Self-Consistent Field, Some Exact Solutions.
V. G. Budanov. 1980, 19p
In Russian.
U.S. Sales Only.

Quantum models for a particle in the field, which have some exact solutions of associative self-consistent field problem are constructed. Regularity of decomposition over inverse constant of classical solution in collective coordinate scheme does not indicate a great value of energy in self-consistent field approximation. Particle excitations in the massive scalar field are examined in symmetric and degenerate vacuum cases. (Atomindex citation 12:602745)

IFVE-OTF-80-132 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Equations for Contour Averages in the Non-Abelian Gauge Theory.
V. V. Bazhanov, and A. P. Isaev. 1980, 18p
In Russian.
U.S. Sales Only.

Peculiarities of a functional equation for the Green simplest contour function have been studied. Singular members of the second variation derivative of the function in a lower order of the common perturbation theory have been calculated over a coupling constant. The simplest result has been obtained for smooth contours without intersections. The calibration theory in the two-dimensional space-time has been studied. It is shown that in this case the Green function satisfies an equation for a wave functional of a relativistic string. The investigation carried on has shown that the calculations of the singular functions have a nice geometric interpretation they are expressed in terms of a metric tensor and coefficients of the second quadratic shape of a smooth surface stretched on the contour. (Atomindex citation 12:614448)

IFVE-OTF-80-139 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Analytical Properties of the Amplitude and Differential Cross Section Behaviour in the Large Scattering Angle Region.
S. M. Troshin, and N. E. Tyurin. 1980, 18p
In Russian.
U.S. Sales Only.

Elastic scattering processes at large angles are considered in the framework of the method of generalized reaction matrix. The power law for the decrease of the differential cross section appears as a consequence of the analytical properties of the scattering amplitude. Angular dependence for the cross section is calculated. (Atomindex citation 12:603719)

IKDA-80/3 PC **A03**/MF **A01**
Technische Hochschule, Darmstadt (Germany, F.R.). Inst. fuer Kernphysik.
Investigation of the Sup(203,205)Tl Level Schemes after (N,N' gamma) Reactions at 2.75 MeV.
S. Hegewisch, H. Vonach, H. Wohlfarth, R. Kretz, and H. Backe. Jun 80, 40p
U.S. Sales Only.

Some 259 gamma -lines have been observed with Ge(Li) detectors from sup(203,205)Tl(n,n' gamma) reactions with 2.75 MeV neutrons using sup(nat)Tl and enriched exp 203 Tl samples. The different gamma lines could be attributed unambiguously to the exp 203

Tl and exp 205 Tl isotopes. It was possible to assign only 60 and 54 transitions to the known level schemes of exp 203 Tl and exp 205 Tl, respectively. From these facts it can be concluded that the low spin members in sup(203,205)Tl between 1.5 and 2.7 MeV are only partially known. The decay of a 5/2 exp - level at 2623.1 keV in exp 205 Tl was identified and the corresponding transition energies have been measured. With these results isomer shifts of several gamma lines corresponding to the decay of the same 5/2 exp - level in muonic exp 205 Tl were determined. (Atomindex citation 11:561464)

INDC(CCP)-154/L PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
Investigations of the Interactions of Neutrons with exp 238 U Nuclei.
B. V. Zhuravlev, L. E. Kazakov, V. N. Kononov, N. V. Kornilov, and B. D. Kuz'minov. Aug 80, 16p
U.S. Sales Only.

The paper reviews a number of experimental investigations of the interaction, mainly fission, inelastic scattering, (n,2n) and radiation capture of neutrons with uranium 238 nuclei performed at the Institute of Physics and Power Engineering, Obninsk, USSR. (Atomindex citation 11:568411)

INDC(NDS)-105/N PC **A04**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
Second Coordinated Research Meeting on the Measurement and Evaluation of Transactinium Isotope Nuclear Data, Aix-en-Provence, 30 April - 1 May 1979. Summary Report.
A. Lorenz. Nov 79, 69p CONF-7904156-(Sum.)
Coordinated research meeting on the measurement and evaluation of transactinium isotope nuclear data, Aixen-Provence, France, 30 Apr 1979.
U.S. Sales Only.

The second meeting of the participants in the IAEA coordinated research programme to measure and evaluate required nuclear decay data of transactinium isotopes, was convened by the IAEA Nuclear Data Section on 30 April - 1 May 1979 in Aix-en-Provence, France. The meeting participants reviewed the current measurement programmes, continued with the review of proposed transactinium isotope decay data, and recommended the release of a list of proposed half-life values which will be subject to revision based on comments received. (Atomindex citation 11:564186)

INDC(NDS)-108/N PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
Proposed Recommended List of Transactinium Isotope Decay Data. Part I. Half-Lives (September 1979 Edition).
A. Lorenz. Sep 79, 7p
U.S. Sales Only.

A proposed list of recommended values of transactinium isotope half-lives and branching fractions, compiled by members of the IAEA Coordinated Research Programme on the Measurement and Evaluation of Transactinium Isotope Decay Data is presented. (Atomindex citation 11:564188)

INDC(SEC)-55/URSF PC **A09**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
WRENDA 76/77. World Request List for Nuclear Data.
R. M. Lessler. Aug 76, 191p
U.S. Sales Only.

The nuclear data request lists for fission reactors, fusion reactors and nuclear safeguards development appear in Parts II, III and IV, respectively, of this document. Supporting information which is pertinent to only one of the request lists has been collected in sections immediately preceding the relevant request list. Information applicable to all the request lists appears in Part I. Expansions of codes used in the request lists can be found in the appendices at the end of the document. (Atomindex citation 11:564189)

INDC(SEC)-73/URSF PC **A09**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
WRENDA 79/80. World Request List for Nuclear Data.
D. W. Muir. Oct 79, 179p
U.S. Sales Only.

WRENDA 79/80 is the sixth edition of the World Request List for Nuclear Data. This list is produced from a computer file of nuclear data requests, maintained by the Nuclear Data Section of the International Atomic Energy Agency (IAEA). The requests are provided by official bodies, such as national nuclear data committees, through four regional data centers serving all Member States of the IAEA. The requests in this edition come from 15 different countries and one international organisation. This edition reflects numerous recent changes to the request file, the first major file update since the production of the previous edition, WRENDA 76/77. The revised list contains a total of 1780 requests, 60% of which are either new or modified since the previous edition. The total number of requests related to fission reactor technology is 1329, very nearly unchanged, while the number related to nuclear fusion has increased from 328 to 449. In contrast to previous editions, requests associated with all applications are presented here in a single, unified list. (Atomindex citation 11:564190)

INDC(YUG)-6/L PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
Prompt gamma -Ray Spectra and Integrated Cross Sections for the Radiative Capture of 14 MeV Neutrons for 28 Natural Targets in the Mass Region from 12 to 208.
M. Budnar, F. Cvelbar, and E. Hodgson. Dec 79, 23p
U.S. Sales Only.

Prompt gamma -ray spectra and integrated cross sections of the radiative capture of 14.6 MeV neutrons in Mg, exp 27 Al, Si, exp 31 P, S, Ca, exp 45 Sc, exp 51 V, Cr, exp 55 Mn, Fe, exp 59 Co, Cu, Se, Br, Sr, exp 89 Y, In, Sb, exp 127 I, Ba, exp 141 Pr, exp 165 Ho, exp 181 Ta, W, Tl, Pb, exp 209 Bi are presented. Data are obtained by the use of the telescopic scintillation pair spectrometer, allowing the measurement of the spectra integrated over 4 pi solid angle for light nuclei and over 2 pi solid angle for heavy nuclei. (Atomindex citation 12:577037)

INDC-34/L PC **A04**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee.
Technical Minutes of the Tenth INDC Meeting.
H. Motz. Jul 80, 56p CONF-7810273-1
10. INDC meeting, Bucharest, Romania, 3 Oct 1978.
U.S. Sales Only.

This document contains the minutes of the 10. INDC meeting, 3-7 October 1978 in Bucharest, Romania. (Atomindex citation 12:603973)

INIS-mf-6301 PC **A05**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Elementary Particles. Issue 3. 6. School of Physics of ITEP.
1979, 99p
In Russian.
U.S. Sales Only.

Individual items from the report were prepared separately for the data base. (ERA citation 07:005800)

INP-1050/PH PC **A02**/MF **A01**
Institute of Nuclear Physics, Krakow (Poland).
Differences Between Some Characteristics of Slow Particles Produced in Interactions of Pions and Protons with Nuclei at High Energies.
J. Babecki, and G. Nowak. 1979, 23p
U.S. Sales Only.

The differences between some characteristics of slow particles produced in interactions of high-energy pions and protons with nuclei were observed. These differences could be explained if the mean inelasticity coefficient in the laboratory system in pi p interactions were larger than that in pp interactions at the same primary energy. (Atomindex citation 12:579859)

INP-1053/PH PC **A02**/MF **A01**
Institute of Nuclear Physics, Krakow (Poland).
Double Scattering Processes in pi exp - D Interactions at 21 GeV/C.
A. Eskreys, K. Eskreys, D. Kisielewska, B. Pawlik, and L. Suszycki. 1979, 24p
U.S. Sales Only.

The effects of double scattering are extracted from experimental data on pi exp - D interactions at 21GeV/c. Multiplicity, rapidity y, xsub(F) and psub(T) distributions for double scattering process are presented. It is found that double scattering occurs in 11% of pi exp - D interactions at this energy: its relative importance increases with the charged multiplicity N, and the largest absolute contribution is at N=6 and 8. The multiplicity distribution for double scattering has mean <Nsub(-)>=1.83+-0.02 and dispersion Dsub(-)=0.92+-0.04. The distributions in rapidity, xsub(F) and psub(T) are similar to those of single scattering processes, but the relative importance of double scattering increases at large psub(T) and at low xsub(F) or y. The distributions are similar at all multiplicities, and for pi exp + and pi exp - . (Atomindex citation 12:576892)

INS-356 PC **A03**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Non-Trivial Realizations of the BRS Supersymmetry.
K. Fujikawa. Oct 79, 33p
U.S. Sales Only.

It has been previously shown that any BRS invariant n-"ghost" state exp + n> in gauge theory is generated by the BRS charge Q, namely, exp + n> = Q exp + n tilde> with a suitable state exp + n tilde> if Q exp + n> = 0. This fundamental property of the non-trivial realization of the nil-potent algebra is further clarified by deriving the decomposition rule for the BRS supersymmetry, which allows us to reduce a product of non-trivial BRS superfields into a set of irreducible superfields. We thus succeed in a complete classification of state vectors according to their representation content of the BRS supersymmetry. It is also noted that the non-trivial realization is characterized by a regular matrix form for the nil-potent charge Q in a certain sector of the Fock space. (Atomindex citation 11:560310)

INS-357 PC **A02**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Instability in Relativistic Nuclear Matter.
H. Tezuka. Nov 79, 23p
U.S. Sales Only.

The stability of the Fermi gas state in the nuclear matter which satisfies the saturation property is considered relativistically. It is shown that the Fermi gas state is stable at very low density and at high density, but it is unstable for density fluctuation in the intermediate density region including the normal density. (Atomindex citation 11:561363)

INS-358 PC **A02**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Mixed-Parity Molecular-Orbits in the Scattering Process Induced by exp 12 C on exp 13 C.
B. Imanishi. Nov 79, 21p
U.S. Sales Only.

In the scattering of exp 12 C on exp 13 C possible formation of the molecular orbits of the valence neutron around the centres of two exp 12 C nuclei is pointed out. In the plus parity states of the total system characteristic molecular orbits (for example, exp 12 C-n- exp 12 C chain) are obtained with the l-parity mixing (p- and sd shells) of the single particle orbits in each exp 12 C nucleus. The inelastic scattering transitions concerned with the valence neutron excitation are given rise to mainly in the plus parity states in the process of the molecular orbit formation. The angular distributions show symmetric form with respect to 90 exp 0 . (Atomindex citation 11:561364)

INS-359 PC **A02**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Definite Evidence for the Formation of Molecular Neutron Orbits in the Scattering of exp 12 C on exp 13 C.
W. von Oertzen, B. Imanishi, H. G. Bohlen, W. Treu, and H. Voit. Nov 79, 14p
U.S. Sales Only.

Theoretical and experimental evidence for molecular neutron orbits in the exp 12 C + exp 13 C system is given. It is shown in a coupled channel calculation that the neutron orbit in the grazing collision of exp 12 C on exp 13 C are of molecular nature. The neutron transfer probability (or formation probability of the molecular orbit) is greatly enhanced due to the mixing of the 1p sub(1/2) and 2s sub(1/2), 1d sub(5/2) shells (l-parity mixing). The cross section of the excitation of the exp

13 C sub(1/2) + (3.09 MeV) state is dominated by even molecular states (odd states cannot contribute because they have a node between the two centers) and this prediction is confirmed in the experiment. (Atomindex citation 11:561365)

IPNO-PhN-80-04 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
About the Experimental Investigation of Nuclear Deformation at Very High Angular Momentum.
C. Roulet. 1980, 17p CONF-800139-7
18. international winter meeting on nuclear physics, Bormio, Italy, 21 Jan 1980.
U.S. Sales Only.

A total gamma -ray energy spectrometer has been used to select angular momentum windows in the decay pattern of compound nuclei. Various kinds of counters were used in coincidence with the big crystal such as single small NaI detectors of Ge(Li) counters. An average angular momentum together with an affective moment of inertia are derived versus the total gamma -ray energy. A variety of nuclei have been investigated with the aim to follow the nuclear behavior and try to determine the nuclear shapes up to very high spins. Residual nuclei in the vicinity of Er exp 160 , Yb exp 166 and Nd exp 136 exhibit a fairly constant effective moment of inertia close to the rigid body value over a wide range of angular momentum. On the other hand, to tellurium isotopes around A = 118 which behave like vibrators at low spins, corresponds an effective moment of inertia which increases rather quickly with the angular momentum towards the rigid body value. This could be explained by the occurence of many band-crossings as it is shown by the E gamma -E gamma correlation data obtained for this particular case. The light Dysprosium nuclei (A approximately 152) which are described below spin 36 by states built on configurations with a few number of quasi-particles, exhibit after spin 50 a well developped E2 bump in the transition energy spectra. However the centroid of that bump does not change with an increase in angular momentum an then is neither characteristics of a well defined effective moment of inertia nor of a pure collective motion. No clear evidence of exterme nuclear deformations such as prolate shapes with a ratio of principal axis of 2 to 1 has been observed so far within the experimental uncertainties for the nuclei which have been studied in the present work. (Atomindex citation 12:577040)

IPNO-PhN-80-05 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Angular Momentum Selection Rule and the exp 9 Be(Pi exp + ,p) exp 8 Be Reaction at 50 MeV.
D. Bachelier, J. L. Boyard, T. Hennino, J. C. Jourdain, and P. Radvanyi. 1980, 15p
U.S. Sales Only.

Angular distributions have been measured at 50 MeV for the exp 9 Be(pi exp + ,p) exp 8 Be reaction leading to the 0 exp + , 2 exp + and 4 exp + states of exp 8 Be. An angular momentum selection rule is considered in order to account for the preferential excitation of high spin states. Two-step processes in the framework of the DWBA and momentum sharing in the two-nucleon model are also discussed. (Atomindex citation 11:561482)

IPNO-PhN-80-09 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Single-Particle and Core-Excited States in exp 49 Sc. I - The exp 48 Ca(Exp 3 He,D) exp 49 Sc Reaction.
S. Fortier, E. Hourani, and J. M. Maison. 1980, 33p
U.S. Sales Only.

The exp 48 Ca(exp 3 He,d) exp 49 Sc reaction has been studied at 25 MeV incident energy. Angular distributions have been measured from 5 exp 0 to 40 exp 0 using a split pole spectrometer, for about 160 levels located up to 18 MeV excitation energy. A local zero range DWBA analysis has been carried out, using Gamow functions as form factors in the case of unbound states; l assignments and spectroscopic factors are obtained for a large number of levels, most of them previously unknown. The summed experimental spectroscopic strengths for the T, l=1 and l=3 levels are in good agreement with the shell-model sum rule limits for 1f-2p proton states, and their energy centroids have been determined. The 1g(9/2) strength in exp 49 Sc is strongly fragmented: about 27% of the T strength is carried by twenty three levels located between 6.5 and 13.5 MeV. Spectroscopic factors for analog states are compared with those from previous (p,p), (exp 3 He,dp) and (d,p) experiments. (Atomindex citation 11:568568)

IPNO-PhN-80-10 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Single-Particle and Core-Excited States in exp 49 Sc. II. The exp 48 Ca(Alpha ,T) exp 49 Sc Reaction.
S. Fortier, J. M. Maison, J. P. Schapira, and I. Fodor-Lovas. 1980, 33p
U.S. Sales Only.

The exp 48 Ca(alpha ,t) exp 49 Sc reaction has been studied at 36 MeV incident energy. About eighty levels have been observed up to 7.5 MeV excitation energy and angular distributions were measured from 6 exp 0 to 58 exp 0 , using a split-pole spectrometer. A local zero-range DWBA analysis has been carried out, and the deduced l-assignments and spectroscopic factors are compared with those obtained from the (exp 3 He,d) reaction. In the other hand, a large number of angular distributions cannot be reproduced by the DWBA calculations; they have been compared with the results of coupled-reaction-channel calculations, assuming two-step excitation of weak coupling states with a (exp 48 CaXfsub(7/2)) structure. A good agreement between experimental angular distributions and two-step predictions is obtained for several exp 49 Sc levels suggesting spin and parity assignments. Moreover, as rather large cross sections are predicted for two-step excitations, it is concluded that, generally, these processes cannot be neglected in the analysis of (alpha,t) reactions. (Atomindex citation 11:561483)

IPNO-PhN-80-12 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Exp 189 Pt, exp 191 Pt Via the (P,D) Reaction.
J. Kalifa, G. Berrier-Ronsin, M. Vergnes, G. Rotbard, and J. Vernotte. 1980, 14p
U.S. Sales Only.

The (p,d) reaction has been performed at 25 MeV incident energy, on a rare exp 190 Pt target (35%) and on targets of exp 192 Pt (57%) and natural Pt. In exp 189 Pt, eleven levels are observed up to 600 keV. In exp 191 Pt, 18 levels are observed, four for the first time, up to 925 keV. Mass excesses are deduced for exp 191 Pt, exp 190 Pt, exp 189 Pt and exp 188 Pt. Comparison of the experimental angular distributions with D.W.B.A. calculations allows the determination of parity and spin limits for most of the final levels. Spectroscopic factors are deduced. Comparison with preceding experiments on heavier isotopes shows a smooth variation for the observed strengths between A = 197 and A = 189, with a minimum fragmentation of the l = 1 strength in exp 193 Pt. (Atomindex citation 11:561484)

IPNO-PhN-80-13 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Study of exp 24 Mg(Exp 18 O, exp 16 O) exp 26 Mg Reaction at E sub 180 =50MeV Including Scattering in Entrance and Exit Channel.
M. Bernas, F. Pougheon, M. Roy-Stephan, G. P. A. Berg, and B. Berthier. 1980, 43p
U.S. Sales Only.

Cross section angular distributions of exp 24 Mg(exp 18 O, exp 16 O) exp 26 Mg reaction at 50 MeV incident energy leading to the first four excited states in exp 26 Mg and the elastic and inelastic scattering for exp 18 O + exp 24 Mg at 50 MeV and exp 16 O + exp 26 Mg at 56 MeV have been measured in order to investigate the reaction mechanism of the two-nucleon transfer reaction including the analysis of incident and exit channels. The measured angular distributions were analyzed in the framework of the EFR-DWBA. Two neutron transfer amplitudes were determined using the 2s-1d shell model amplitudes calculated by Chung and Wildenthal. The large experimental cross section in contrast to the smallness of the direct transfer amplitude and the peculiar shape of the measured angular distribution of the lowest 2 sub 1+ state suggests that this level is mainly excited by two-step processes. It is shown that a CCBA calculation describes successfully the angular distributions of the ground state and the 2 sub 1+ state in exp 26 Mg. (Atomindex citation 12:577041)

IPNO-PhN-80-14 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Statistical Model Analysis for the Deexcitation of the exp 79 Rb Formed by the exp 16 O+ exp 63 Cu and exp 34 S+ exp 45 Sc Compound Nucleus Reaction.
J. Barreto, and M. Langevin. 1980, 31p
U.S. Sales Only.

A complete statistical model analysis is presented for the exp 79 Rb compound nucleus formed by the exp 16 O + exp 63 Cu and exp 34 S + exp 45 Sc reactions on a broad excitation energy interval. Most of all deexcitation channels are compared with the predictions of the codes ALICE and JULIAN. The results show that gamma -ray competion with particles emission in the deexcitation of the exp 79 Rb compound nucleus is very important. From these comparisons, a detailed analysis is performed on the approximations made in both evaporation codes. (Atomindex citation 11:564194)

IPNO-PhN-80-15 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
First Study of the (Exp 14 C, exp 12 C) Reaction. Selectivity of This Reaction and the Energy Levels.
F. Pougheon, M. Bernas, M. Roy-Stephan, C. Detraz, and D. Guillemaud. 1980, 29p
U.S. Sales Only.

The first measurements are reported for (exp 14 C, exp 12 C) two-neutron stripping reactions. Energy spectra up to an excitation energy of 12 MeV have been measured at 69 MeV for the exp 26 Mg (exp 14 C, exp 12 C) and exp 28 Si (exp 14 C, exp 12 C) reactions. A strong selectivity of this reaction is observed. Using this selectivity, the comparison of the spectra suggests Jsup(pi) assignments for several exp 30 Si and exp 28 Mg states. The results from other two neutron stripping reactions, (t,p) and (exp 18 O, exp 16 O) are compared with those of the (exp 14 C, exp 12 C) reaction. (Atomindex citation 11:568569)

IPNO-PhN-80-20 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Gamma Activity from exp 11 Li beta Decay.
C. Detraz, D. Guillemaud, M. Langevin, F. Naulin, and M. Epherre. 1980, 11p
U.S. Sales Only.

The energies and absolute intensities of the gamma -rays from the beta -decay of exp 11 Li are measured. There is no sizable beta branch to the exp 11 Be ground state. Only (5.2+-1.4)% of the beta -decay strength does not lead to beta -delayed particle emission. New beta -delayed neutron branches to excited states of exp 10 Be are observed and the total delayed neutron emission probability is deduced. (Atomindex citation 11:568571)

IPNO-RC-80-04 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Spin Determination of Highly Excited Nuclei from Light Particle Emission Studies.
D. Guerreau, and R. Babinet. Apr 80, 14p CONF-800452-12
International conference on nuclear behavior at high angular momentum, Strassbourg, France, 22 Apr 1980.
U.S. Sales Only.

It is shown in this paper how one can take advantage of evaporated charged particles emitted by fully thermally equilibrated systems to extract information on spin and alignment. The emphasis is made on a complete study of the system exp 40 Ar+ exp 58 Ni at 280 MeV. For this specific example, a very good agreement with the sticking limit has been obtained. Moreover, the degree of alignment of deeply inelastic fragments was found to be very strong. Finally, the general use of particle emission properties in other situations than deeply inelastic collision studies is discussed. (Atomindex citation 11:568572)

IPNO-T-78-04 PC **A04**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Proton Pick-Up on Ga, Ge and As Isotopes.
G. La Rana. 1979, 69p
In French.Thesis.

U.S. Sales Only.

The exp 69 Ga, exp 71 Ga(d, exp 3 He) exp 68 Zn, exp 70 Zn, exp 70 Ge, exp 72 Ge, exp 74 Ge, exp 76 Ge(d, exp 3 He) exp 69 Ga, exp 71 Ga, exp 73 Ga, exp 75 Ga and exp 75 As(d, exp 3 He) exp 74 Ge reactions have been studied with an overall resolution of 15 to 18 KeV. The spectroscopic factors have been determined for 11 to 24 levels in each final nucleus. Level schemes are proposed for the previously unknown exp 73 Ga and exp 75 Ga. The small value of tau(0 sub 2+)/tau(0 sub 1+) found for exp 74 Ge is consistent with a very simple description of wave functions previously proposed for Ge nuclei. These wave functions are seen to reproduce the measured occupation numbers for the proton orbitals. An anomaly in these occupation numbers is observed between N=40 and 42 could be related to a nuclear shape transition. (Atomindex citation 11:568573)

IPNO-TH-79-33 PC **A04**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Mass Parameters in the Adiabatic Time-Dependent Hartree-Fock Approximation. I. Theoretical Aspects: The Case of a Single Collective Variable.
M. J. Giannoni, and P. Quentin. Jun 79, 61p
U.S. Sales Only.

A self-consistent method to evaluate mass parameters is presented in the framework of the adiabatic limit of the time-dependent Hartree-Fock approximation, reduced to a single collective variable. The corresponding collective path is assumed to be given either by solving a constrained Hartree-Fock problem with a given time-even constraining operator Q, or by scaling a static Hartree-Fock equilibrium solution. In the former case, once the path is given, a method for solving the equation of motion (of Hamilton type) is provided, which reduces to a double-constrained Hartree-Fock problem with the time-even constraint Q and with a time-odd constraining operator P. In the case of the scaling path, an analytical solution of the Hamilton equation is discussed and the adiabatic mass for the particular case of isoscalar quadrupole Q sub 20 mode is given. The operator P, which is uniquely determined from the knowledge of Q, has the physical meaning of a momentum operator: it satisfies, together with Q, a weak quantal conjugation relation. Finally, the connection between the two paths is discussed in terms of generalized RPA sum rules. (Atomindex citation 11:564068)

IPNO-TH-79-34 PC **A04**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Mass Parameters in the Adiabatic Time-Dependent Hartree-Fock Approximation: II. Results for the Isoscalar Quadrupole Mode.
M. J. Giannoni, and P. Quentin. Jun 79, 72p
U.S. Sales Only.

The formalism presented in a previous paper, is used to compute self-consistent adiabatic mass parameters for the isoscalar quadrupole modes. Skyrme-like effective forces have been used. A detailed study of the practical methods of calculation is made. A special attention is devoted to the problem of numerical accuracy. Results are presented for both scaling and constrained Hartree-Fock paths. A comparative discussion of the two corresponding sets of results is made. The method used to calculate self-consistent mass parameters for the constrained Hartree-Fock path provides, as a by-product, the non self-consistent cranking mass. This method (for self-consistent as well as cranking masses) is free of continuum problems inherent to the application of the usual cranking formula. The effect of self-consistency is extensively studied by use of a large set of Skyrme-like forces. (Atomindex citation 11:564069)

IPNO-TH-79-59 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Effects of Short Range Correlations on Nuclear Mass and Momentum Distributions.
O. Bohigas, and S. Stringari. Nov 79, 11p
U.S. Sales Only.

Effects of short range correlations on the form factor and the momentum distribution of nuclear systems are investigated. The present analysis, performed in the framework of the Jastrow approach, indicates that an independent-particle wave function (Slater determinant) cannot reproduce simultaneously the form factor and the momentum distribution is strongly affected by correlations beyond 2 fm exp -1 . (Atomindex citation 11:561366)

IPNO-TH-80-07 PC **A04**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Low Energy Nucleon-alpha Scattering: Microscopic Potentials and Phase-Shifts.
M. Lassaut, and N. Vinh Mau. Feb 80, 56p
U.S. Sales Only.

The nucleon-alpha potential is derived in the antisymmetrized folding model from different effective interactions without and with density dependence. Local equivalent potentials are calculated in two different approximations. The phase shifts for energies below 25 MeV obtained with these two sets of potentials are discussed. (Atomindex citation 11:568208)

IPNO-TH-80-11 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Self Consistent Description of Nuclear Level Densitities.
M. Barranco, and J. Treiner. Mar 80, 28p
U.S. Sales Only.

We present a self consistent calculation of the nuclear level density based on a generalization to finite temperature of a modified Thomas-Fermi method. A simple expression is derived for the so-called level density parameter a entering the expression of the density of states Xi(E)=Esup(-5/4)e exp 2 sqrt aE and relating the excitation energy to the temperature E=a T exp 2 , in terms of nucleons equilibrium densities at T=0 only. One thus avoids the difficulty of adding external constraints to calculate isolated nuclei at finite temperature which are shown to be unstable against particle emission. The role of the nuclear surface is discussed. It is shown that the effective mass of the interaction plays a crucial role in determining the value of a and comparison with experiment confirms the value m*/m > = 1 near the Fermi level obtained through more microscopic analysis. (Atomindex citation 11:561367)

IPNO-TH-80-13 PC **A04**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Sum-Rules, Strength Distributions and Giant Resonances.
O. Bohigas. Mar 80, 59p
U.S. Sales Only.

Some general properties of strength distributions and their moments (sum-rules) are discussed. Special emphasis is made on selfconsistent-RPA-sum-rules. The experimental information on electric monopole, dipole and quadrupole strength is reviewed and discussed. (Atomindex citation 11:568209)

IPNO-TH-80-15 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Selfconsistent Description of Photoabsortion Cross-Sections.
O. Bohigas, N. Van Giai, and D. Vautherin. Aug 80, 1p CONF-800863-8(Sum.)
International conference on nuclear physics, Berkeley, CA, USA, 24 Aug 1980.
U.S. Sales Only.

No abstract available.

IPNO-TH-80-23 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Parity Non Conserving Effects in the Radiative Thermal Nd Capture.
B. Desplanques, and J. J. Benayoun. Aug 80, 2p CONF-800829-13(Sum.)
International conference on the few body problems, Eugene, OR, USA, 17 Aug 1980.
U.S. Sales Only.

No abstract available.

IPNO-TH-80-26 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
On-Shell Baryon-Baryon Semi-Local Duality Relations.
P. Zenczykowski. Jun 80, 14p
U.S. Sales Only.

Parent-parent on-shell semi-local duality relations between s- and u-channel resonances in pi N amplitudes are studied. The appropriate s-u crossing symmetric way of imposing conditions on residues lead to the duality pattern alpha implies delta, delta implies alpha , gamma implies beta , beta implies gamma . The obtained relations between the masses of natural and unnatural baryon resonances are approximately satisfied for a very wide range of masses thus allowing different patterns of EXD breaking in the opposite naturality sectors. (Atomindex citation 11:567727)

IPNO-TH-80-31 PC **A02**/MF **A01**
Paris-11 Univ., Orsay (France). Inst. de Physique Nucleaire.
Polarized Pp Scattering, Models of the Parity-Non-Conserving Force and Contribution of the Weak Pp Force to Other Processes.
B. Desplanques. Jun 80, 1p CONF-8006161-1(Sum.)
International symposium on high precision nuclear physics, Bad Honnaf, F.R. Germany, 9 Jun 1980.
U.S. Sales Only.

No abstract available.

ISN-80-01 PC **A07**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Annual Report 1979.
1980, 134p
In French.

The research and development activities of the ISN for 1979 are reported. The main thrust is directed towards the SARA (Rhone-Alpes Accelerator System) project and the various technical and experimental aspects. Research work was carried out in the following areas: nuclear spectroscopy, giant resonances, reaction processes, experiments at ILL, intermediate energy physics and for the theoretical group: nuclear structure, nuclear reactions, three-body problem, thermal neutron capture and hypernuclear spectroscopy. (Atomindex citation 12:576950)

ISN-80-04 PC **A02**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Two-Nucleon High-Spin States in Odd-Odd Copper: The exp 66 Cu Case.
Feb 80, 2p CONF-800452-13(Sum.)
International conference on nuclear behavior at high angular momentum, Strassbourg, France, 22 Apr 1980.
U.S. Sales Only.

No abstract available.

ISN-80-07 PC **A02**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Identification of High Spin Isomers Near N=82.
S. Andre, J. Genevey, A. Gizon, J. Gizon, and J. Jastrzebski. Feb 80, 2p CONF-800452-8(Sum.)
International conference on nuclear behavior at high angular momentum, Strassbourg, France, 22 Apr 1980.
U.S. Sales Only.

No abstract available.

ISN-80-16 PC **A03**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Asymmetric Rotator Model Applied to Odd-Mass Iridium Isotopes.
R. Piepenbring. Apr 80, 33p
U.S. Sales Only.

The method of inversion of the eigenvalue problem previously developed for nuclei with axial symmetry is extended to asymmetric equilibrium shapes. This new approach of the asymmetric rotator model is applied to the odd-mass iridium isotopes. A satisfactory and coherent description of the observed energy spectra is obtained, especially for the lighter isotopes. (Atomindex citation 11:561372)

ISN-80-17 PC **A05**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.

Shapes of Nuclear Configurations in a Cranked Harmonic Oscillator Model.
T. Troudet, and R. Arvieu. May 80, 76p
U.S. Sales Only.

The shapes of nuclear configurations are calculated using Slater determinants built with cranked harmonic oscillator single particle states. The nuclear forces role is played by a volume conservation condition (of the potential or of the density) in a first part. In a second part, we have used the finite range, density dependent interaction of Cogny. A very simple classification of configurations emerges in the first part, the relevant parameter being the equatorial eccentricity of the nuclear density. A critical equatorial eccentricity is obtained which governs the accession to the case for which the nucleus is oblate and symmetric around its axis of rotation. Nuclear configurations calculated in the second part observe remarkably well these behaviors. (Atomindex citation 11:568214)

ISN-80-29 PC **A02**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Imaginary Spin-Orbit Potential in the Inelastic Scattering of Polarized Protons from exp 12 C and exp 16 O.
R. de Swiniarski, and D. L. Pham. Jun 80, 9p
U.S. Sales Only.

Analyzing powers and cross sections for elastic and inelastic scattering of 20, 30 and 40 MeV polarized protons from exp 12 C and exp 16 O have been analyzed in the coupled-channels collective model using the full Thomas deformed spin-orbit term. Evidence is given that there is an imaginary spin-orbit potential in the proton optical potential for these nuclei. (Atomindex citation 12:576951)

ISN-80-30 PC **A02**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Inelastic Scattering of exp 9 Be of 27 MeV/A to Giant Resonances.
D. Lebrun, M. Buenerd, M. Bini, B. G. Harvey, and R. Legrain. Jul 80, 8p
U.S. Sales Only.

Inelastic scattering spectra have been measured with 245 MeV incident energy exp 9 Be ions, on exp 208 Pb target. They show large excitation of the exp 208 Pb giant quadrupole resonance. DWBA calculations are reported and compared with the data. (Atomindex citation 12:577043)

ISN-80-31 PC **A03**/MF **A01**
Grenoble-1 Univ. (France). Inst. des Sciences Nucleaires.
Deeply Inelastic Collisions and Fusion in the exp 20 Ne + exp 40 Ca System.
Jul 80, 29p
U.S. Sales Only.

Cross sections for deeply inelastic collisions, fusion, and elastic scattering of exp 20 Ne on exp 40 Ca were measured at 151 MeV. The critical angular momentum Lsub(cr) and the grazing one Lsub(gr) deduced from the fusion and elastic scattering data were used in an attempt to interpret the fragment kinetic energies in deeply inelastic collisions in terms of a rotating double-nucleus system whose contributing initial angular momentum depends explicitly on the amount of nucleon transfer. (Atomindex citation 12:577044)

ITEF-137(1980) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Secondary Measurements of P Odd Asymmetry Coefficients at exp 233 U, exp 235 U and exp 239 Pu Fission by Polarized Thermal Neutrons.
B. D. Vodennikov, G. V. Danilyan, V. P. Dronyaev, V. V. Novitskii, and V. S. Pavlov. 1980, 14p
In Russian.
U.S. Sales Only.

The results of secondary measurements of asymmetry coefficients at sup(233)U, sup(235)U, sup(239)Pu fission by polarized thermal neutrons are presented. The ionization chamber without a grid was used in this case as opposed to those experiments when fission fragments were registered by silicon surface-barrier detectors. This allowed the use of fissionable material targets with large area, which determined good statistical accuracy of results. The following values of asymmetry coefficients are obtained: a (sup(234)U)=(4.2+-0.3)x10sup(-4), a (sup(236)U)=(1.1+-0.2)x10sup(-4), a (sup(240)Pu)=(-6.7+-0.9)x10sup. (Atomindex citation 12:603974)

ITEF-22(1980) PC **A04**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Introduction into Quantum Chromodynamics. The Principles of the Theory.
M. B. Voloshin. 1980, 74p
In Russian.
U.S. Sales Only.

The principles of the gauge theory of coloured quarks and gluon strong interaction - the quantum chromodynamics are given in lectures. The Yang-Mills theory, the main principle of which is the gauge invariance of electrodynamics is discussed in detail. The lagrangian of the theory with local gauge invariance in relation to the SU(N) group is determined. The equations of motion for the Yang-Mills fields are derived. The Feynman rules in the Yang-Mills theories are considered. The effective charge behaviour at small distances is studied in the framework of quantum electrodynamics. The Gell-Mann-Law function is calculated and the important characteristics of quantum chromodynamics - the asymptotic freedom is discussed. (Atomindex citation 12:603736)

ITEF-29(1979) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Nucleon Weak Interaction in the Weinberg-Salam Model.
G. A. Lobov. 1979, 19p
In Russian.
U.S. Sales Only.

Potentials of nucleon weak interaction due to exchange of the nonet vector mesons have been obtained in the Weinberg-Salam model applying the vector dominancy. The contribution of neutral hadron currents from charged pi -meson exchange to the weak interaction potential is determined. The isotopic structure of the potentials obtained, which in the Weinberg-Salam model is determined unambiguously, has been examined. Amplification of effects of nucleon weak interaction in nuclei caused by contributions of neutral hadron currents is discussed. Presented is the nuclear single-particle potential of weak interaction obtained from a two-particle potential by averaging over the states of a nuclear core. An approach to nucleon weak interaction based on the quark model is considered. (Atomindex citation 11:567730)

ITEF-85(1979) PC **A04**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Neutrino Interactions and Its Properties (1977-1978). Charged Currents.
I. S. Tsukerman. 1979, 69p
In Russian.
U.S. Sales Only.

Reviewed are the results of experiments on inclusive nu N(anti nu N) interactions stipulated by charged currents. Main experiments were carried out in Batavia, Geneva, Serpukhov, Moscow during 1977-1978 years. Presented are data on energetic dependencies of total cross-sections of nu N(anti nu N)-interactions and mean square of four-momentum transferred to a nucleon momentum. Discussed is a problem of scaling breaking at large values of rapidities. Obtained data on energetic and THETA exp 2 -dependence of structure functions also evidence by scaling breaking in nu N(anti nu N)-interactions. (Atomindex citation 11:567889)

ITEP-102(1980) PC **A03**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Threshold Phenomena.
A. M. Badalyan, M. I. Polikarpov, and Yu. A. Simonov. 1980, 41p
U.S. Sales Only.

The problem of existing of the Wigner-Baz' cusps i.e. on irregularity in cross sections near the threshold of an inelastic channel of reactions is considered. On example of the experimental cusp and its theoretical analysis in the exp 65 Cu(p, gamma) exp 66 Zn and exp 65 Cu(p, alpha) exp 62 Ni reactions is discussed. It is shown that this example is evidence of a cusp due to a nearly pole and not a pure Wigner-Baz' cusp. Especially attention is paid to YN systems like the lambda N- sigma N coupled channels. It is concluded from the analysis that the virtual poles in the lambda N system are inside the analyticity region of the 20 MeV radius. The same is time for the sigma N poles. Therefore all exp 3 N sub 1 states in YN systems exist. (Atomindex citation 12:603738)

ITEP-104(1980) PC **A04**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Dynamics of the Coupled Channels.
A. M. Badalyan, M. I. Polikarpov, and Yu. A. Simonov. 1980, 54p
U.S. Sales Only.

The dynamics of the coupled channel interaction is considered. The motion of the poles and behaviour of the cross sections in the framework of different models are discussed. The necessary conditions for a local channel coupling patential of the constant sign for production of a bound state in absence of diagonal interactions is obtained. In more detail the characteristics of the poles in a multichannel system as simulated by the one-channel optical potential model is investigated. (Atomindex citation 12:603739)

ITEP-113(1979) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Neutrino Trident Production at Gsub(F) Level.
A. E. Asratyan. 1979, 12p
U.S. Sales Only.

Upper limits to the strength of diagonal lepton interaction from CDHS and FHOPRW neutrino data are obtained. Prospects for the study of diagonal interaction at Gsub(F) level are explored. Neutron detectors must enable one to study the neutrino-induced muon pair production in a Coulomb field at reasonably small background. (Atomindex citation 11:567890)

ITEP-127(1979) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Antinucleon-Deuteron Interaction Near Threshold.
I. L. Grach, I. M. Narodetskii, and M. Zh. Shmatikov. 1979, 15p
U.S. Sales Only.

The antinucleon-deuteron interaction near threshold is considered. As an input, the pair-separable t-matrix is used which reproduces a large anti NN cross section. From the solution of the Faddeev equations, the missing mass spectrum in the reaction antipd implies Nsub(s) + MM (missing mass) and the resonant structure in the 2NantiN system below the elastic antipd-threshold are obtained. The total and the elastic antipd cross sections are calculated. (Atomindex citation 12:603897)

ITEP-128(1979) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Uncomfined Fractionally Charged Quarks and the Problem of Hidrons.
L. B. Okun, and M. A. Shifman. 1979, 10p
U.S. Sales Only.

A model for partial confinement of fractionally charged quarks with broken local but conserved global color symmetry is discussed. It is shown that it is impossible to liberate quarks and gluons in this way without severe contradictions with experimental data. The model predicts either observable violations of asymptotic freedom or hidrons - new hadron-like objects with mass around 1 GeV and fractional charges. (Atomindex citation 11:567731)

ITEP-147(1979) PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.

Annihilation E exp + E exp - Implies Hadrons Near N Anti N Threshold.
O. D. Dalkarov, and V. G. Ksenzov. 1979, 12p
U.S. Sales Only.

The energy dependence of the cross section for annihilation e exp + e exp - implies hadrons near N anti N threshold is discussed in the coupled channel model. It is shown that strong attraction in the N anti N channel leads to some additional irregularity (not resonances) in the energy dependence of the cross section. (Atomindex citation 12:603740)

ITF-80-25R PC **A02**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Particle Production and Vacuum Polarization by Non-Stationary Electric Field.
V. M. Mostepanenko. 1980, 24p
In Russian.
U.S. Sales Only.

A method for calculating the vacuum polarization of scalar and spinor fields by homogeneous electric field E(t) with arbitrary time dependence is suggested. Using this method the expressions are found for the total vacuum momentum-energy tensor and the current of quantized fields in external electric field of special type. It is shown that for optical freo.uencies Ksub(0) approximately equal to 10 exp -6 m the contribution to the polarization energy density of terms depending on E', E'' is much greater than that of Heisenberg-Euler. (Atomindex citation 12:602778)

ITF-80-53R PC **A02**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Teoreticheskoi Fiziki.
Light Hadron Masses and Pion-Hadron Interactions in Chiral Invariant "Bag" Models.
M. M. Musakhanov. 1980, 11p
In Russian.
U.S. Sales Only.

The chiral invariant generalization of MIT bag models, where the role of the Goldstone particles is played by pions, which interact with the surface of a quark "bag", and do not penetrate inside, is suggested. The chiral corrections to hadron masses which turn to be of gluon order are calculated. Calculations of the transition B implies B' pi (p) amplitudes resulted in reasonable values of constants of the pion-baryon bond. For example, the calculated width of delta resonance, GITA delta =85 MeV. (Atomindex citation 12:603741)

JAERI-1263 PC **A03**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
Comparative Evaluation of Various Optimization Methods and the Development of an Optimization Code System SCOOP.
T. Suzuki. Nov 79, 47p
In Japanese.
U.S. Sales Only.

Thirty two programs for linear and nonlinear optimization problems with or without constraints have been developed or incorporated, and their stability, convergence and efficiency have been examined. On the basis of these evaluations, the first version of the optimization code system SCOOP-I has been completed. The SCOOP-I is designed to be an efficient, reliable, useful and also flexible system for general applications. The system enables one to find global optimization point for a wide class of problems by selecting the most appropriate optimization method built in it. (Atomindex citation 11:571911)

JEN-489 PC **A07**/MF **A01**
Junta de Energia Nuclear, Madrid (Spain).
Beta Spectra. II-Positron Spectra.
A. Grau, and E. Garcia-Torano. 1981, 138p
In Spanish.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Using the Fermi theory of beta decay, the beta spectra for 30 positron emitters have been computed, introducing a correction factor for unique forbidden transitions. The spectra are ploted vs. energy, once normalised, and tabulated with the related Fermi functions. The average and median energies are calculated. (Atomindex citation 12:605313)

JINR-E-1-12730 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Projectile Fragmentation Processes in exp 4 He-Nucleus Interactions at 4.5 GeV/C Per Incident Nucleon.
A. U. Abdurakhimov, V. D. Aksinenko, and M. Kh. Anikina. 1980, 16p
U.S. Sales Only.

Fragmentation processes of exp 4 He nuclei on Li, C, Al and Cu nuclei were studied at 18 GeV/c in the SKM-200 streamer chamber. The fragmentation total cross section, inclusive cross sections for exp 4 He fragment exp 1 He, exp 2 H, exp 3 H and exp 3 He production and cross sections for the production of a few fragments in one interaction have been obtained. Their dependence on the target mass number, Asub(T), could be presented as Asub(T)sup(alpha). It is shown that the alpha parameter value grows with increasing number of nucleons having interacted with (Nsub(int)) target. The A-dependence of (<nsub(-)>) multiplicities and of transversal <psub(T)> = and longitudinal <psub(L)> = momenta of pi exp - mesons accompanying various fragmentation processes is also given. It is shown that with increasing Asub(T) < nsub(-) > does not change practically, if Nsub(int) <= 2, and grows for Nsub(int) > 2. < psub(T) >= and < psub(L) >= within error limits do not depend on Asub(T) at any Nsub. (Atomindex citation 11:568577)

JINR-E-1-80-39 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Proton Multiplicity Distributions in Pion-Xenon Nucleus Collisions at 3.5 GeV/C.
Z. Strugalski, T. Pawlak, W. Peryt, and J. Pluta. 1980, 12p
U.S. Sales Only.

Experimental results from the proton emission investigation in 3.5 GeV/c pion minus-xenon nucleus collisions detected in the 180 xenon bubble chamber are presented and analyzed. The emitted protons are of kinetic energies from 20 to 400 MeV. Multiplicity distributions of protons both accompanied and not accompanied by secondary charged and neutral pions are given. Large proton multiplicities are observed in the events without multiparticle production, the proton multiplicity distribution in this class of events being of an irregular character. The experimental results are well described in the model based on the following hypothesis: a high energy hadron traversing the target causes the monotonous emission of the fast protons in numbers n/sub p/ being equal to the number of protons encountered in the neighbourhood of its path inside the nucleus target. In this case the multiple production goes through some intermediate states which decay after having left the target nucleus. (Atomindex citation 11:564197)

JINR-E-1-80-552 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Complete Destruction of Heavy Nuclei by Hadrons and Nuclei.
K. D. Tolstov. 1980, 6p
U.S. Sales Only.

The total disintegration is considered of Ag and Pb nuclei and exp 4 He, exp 12 C nuclei with a momentum of 4.5 GeV/c per nucleon. It is shown that nucleons are mainly emitted, and there is no residual nucleus the mass of which is comparable to that of the primary nucleus. The probability of total nucleus disintegration is considered as a function of projectile energy, and the mass. The multiplicity, energy and emission angle of particles are considered as well. It is shown that the density of nuclear matter in the overlap zone of colliding nuclei exceeds the usual one by a factor of approximately 4. A comparison is made with interaction models. A conclusion is drawn of the collective interaction mechanism (perhaps, of the shock wave type) of particle ejection from the target nucleus at the first stage of interaction and of explosive decay of the residual nucleus at the next one. (Atomindex citation 12:603899)

JINR-E-2-12863 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Potential with a Dimensional Parameter in the Model of "Hard Collision".
A. V. Sidorov, and N. B. Skachkov. 1979, 7p
U.S. Sales Only.

The quark scattering on effective potential containing the dimensional parameter is considered. It is shown that the data on the reaction pi pi implies pi exp 0 X are well described within the assumption of factorizability of the quark amplitudes. (Atomindex citation 11:567742)

JINR-E-2-12870 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Quark Parton Model with Logarithmic Scaling Violation and High Energy Neutrino Interactions.
P. S. Isaev, and S. G. Kovalenko. 1979, 20p
U.S. Sales Only.

In the framework of the proposed earlier quark parton model with logarithmic scaling violation the cross sections of deep inelastic nu (anti nu)N interactions are calculated, the contribution of the charmed particle production are evaluated. The kinematical mass corrections to scaling violations and threshold effects are taken into account. Joint analysis of the experimental data on deep inelastic ep, ed scattering and charged current neutrino interaction are performed by using the unique set of free parameters of the model. Evaluations of the c-quark and W-boson masses are obtained. Neutral current data as well are analysed. The analysis is performed with taken into account scaling violation effects. The obtained estimations of the charmed quark mass Msub(c)=3.0+-1.2 GeV. W-boson mass Mw=50+-10 GeV, and the Weinberg angle SINsup(2)THETAsub(w)=0.26+-0.04 are within errors in agreement with the generally accepted ones. (Atomindex citation 11:567743)

JINR-E-2-12923 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Geometrical Scaling and Energy Dependence of Proton-Proton Scattering Cross Sections at Large Momentum Transfers.
S. V. Goloskokov, S. P. Kuleshov, and O. V. Seliugin. 1979, 8p
U.S. Sales Only.

A modified expression of the geometrical scaling at large momentum transfers is constructed within the eikonal-type model. Differential cross sections of proton-proton interactions at high energies were calculated and compared with experimental data. It is shown that the geometrical scaling is valid for the scattering amplitude at the momentum transfer range 0<=Vertical BartVertical Bar<=14 GeV exp 2 . (Atomindex citaticn 11:567744)

JINR-E-2-80-110 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Permeability of the Interacting Yang-Mills Instanton Gas.
E. M. Ilgenfritz, and M. Mueller-Preussker. 1980, 20p
U.S. Sales Only.

The permeability mu of the interacting Yang-Mills instanton gas from the partition function, treating the dipole-like interaction by a functional method is calculated. The approach is based on the semiclassical approximation. Following Callan, Dashen, Gross the expression for mu to the discussion of the bag-vacuum phase transition and to the interpolation of the beta - function from weak to strong coupling is applied. The results presented in different renormalization schemes confirm the existence of the first order transition. (Atomindex citation 11:567745)

JINR-E-2-80-219 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Elastic Scattering and Charge-Exchange of Pions by exp 3 He at the Intermediate Energies.
V. B. Belyaev, S. A. Rakityanskii, and J. Wrzecionko. 1980, 13p
U.S. Sales Only.

An attempt is made to describe the experimental data on elastic interaction of pi exp +- mesons with light nuclei in the energy region 68-208 MeV. As the theoretical basis, the approximate four-particle equations modified in the spirit of the impulse approximations are used. The agreement with the data in the forward hemisphere for all energies is achieved. For the backward scattering, the agreement exists only at 68-MeV and 208-MeV pion energy. (Atomindex citation 12:603900)

JINR-E-2-80-445 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Free Massless Scalar Fields in Two Dimensions.
L. K. Hadiivanov. 1980, 14p
U.S. Sales Only.

A common Fock space for two free massless scalar fields, nonlocal with respect to each other, is constructed. The operators corresponding to the two formal charges are correctly defined and it is shown that they generate translationally invariant states from the vacuum. (Atomindex citation 12:602780)

JINR-E-2-80-483 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Three-Loop Calculations in Non-Abelian Gauge Theories.
O. V. Tarasov, and A. A. Vladimirov. 1980, 24p
U.S. Sales Only.

A detailed description of the method for analytical evaluation of the three-loop contributions to renormalization group functions is presented. This method is employed to calculate the charge renormalization function and anomalous dimensions for non-Abelian gauge theories with fermions in the three-loop approximation. A three-loop expression for the effective charge of QCD is given. Charge renormalization effects in the SU(4)-supersymmetric gauge model is shown to vanish at this level. A complete list of required formulas is given in Appendix. (Atomindex citation 12:602781)

JINR-E-2-80-502 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
QCD Corrections to the Weak Hamiltonian and Parity Violation in the NN Reactions.
V. M. Dubovik, V. S. Zamiralov, and S. V. Zenkin. 1980, 8p
U.S. Sales Only.

The gluon corrections to the weak interaction delta S = 0 hamiltonian are calculated taking into account for the intermediate distances x > msub(c)sup(-1). It is shown that these corrections give large negative contributions to the calculated values of gamma polarisation Psub(gamma) in np implies d gamma and the asymmetry parameter Asub(pp) in p vector p implies pp, so so that Psub(gamma) can even change the sign and Asub(pp) increases in the absolute value. (Atomindex citation 12:603743)

JINR-E-2-80-503 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Radiative Corrections to P-Odd Asymmetries in Deep-Inelastic Scattering of Polarized Muons on Nucleons at TeV Energies.
D. Yu. Bardin, O. M. Fedorenko, and N. M. Shumeiko. 1980, 14p
U.S. Sales Only.

The one-loop radiative corrections to the P-odd asymmetries A exp +- and to the charge asymmetry in deep inelastic scattering of polarized muons on nonpolarized nucleons are calculated in the energy range from hundreds of GeV to tens of TeV. The studies are based on the Weinberg-Salam theory and on a simple quark-parton model. The renormalization scheme used for the calculations of the one-loop approximation for the amplitude of lepton-quark scattering is described in detail. (Atomindex citation 12:603744)

JINR-E-2-80-518 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Tensor Polarization in the Pd Backscattering at Intermediate Energies.
B. Z. Kopeliovich, L. I. Lapidus, and L. Vegh. 1980, 3p
U.S. Sales Only.

Tensor polarization of deuterons in the pd backscattering has been calculated by means of the triangle model without free parameters. It has small absolute value in the proton energy interval 400-1000 MeV which is in agreement with the experiment. It is concluded that the triangle model dominates in the isobar region. (Atomindex citation 12:603901)

JINR-E-2-80-525 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Bag Model with Linear Confining Potential.
A. E. Dorokhov, and A. V. Sidorov. 1980, 6p
U.S. Sales Only.

The mass spectrum of vector mesons was calculated by assuming that the energy density of the quarks and gluons within the bag is constant. Quarks within the bag are considered to move quasi-independently and to obey the Dirac equation, with a linear potential that is dependent on distance. Qualitative correspondence with the experimental masses is achieved both for the infinite potential well and for a power potential with small admixture of the Coulomb term. (Atomindex citation 12:603746)

JINR-E-2-80-547 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Statistical Mechanics of the Interacting Yang-Mills Instanton Gas.
E. M. Ilgenfritz, and M. Mueller-Preussker. 1980, 20p
U.S. Sales Only.

Within the framework of the dilute gas approximation the instanton gas with dipole-like interaction is studied, including hard-core repulsion necessarily implied by the consistency of this approximation. A new, selfconsistent scheme is obtained of instanton calculations provided by a cooperative suppression of large instantons instead of the usual ad hoc infrared cut-off. Diluteness is better under control by a single, regularization prescription independent parameter. Functional methods known from statistical mechanics are used to treat the hard-core and dipole interactions simultaneously. The permeability of the instanton gas is calculated and used to discuss the Gell-Mann-Low beta -function in the intermediate coupling range. The results are confronted with recent lattice calculations. (Atomindex citation 12:602782)

JINR-E-2-80-555 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Parity Violation in the Few-Nucleon Systems as the Quark-Nuclear Effect. 3. Circular Polarization of Photons at Radiative Capture of Thermal Neutrons by Protons.
V. M. Dubovik, and I. T. Obukhovskii. 1980, 15p
U.S. Sales Only.

The advantages of the quark-nuclear approach to the description of parity violation (PV) effects are demonstrated by the example of the np implies d gamma reaction. At small distances nucleons are considered as 3q - clusters of 6q - states with the configurations s exp 6 and s exp 4 p exp 2 . PV is described by the standard electroweak model. Within this approach a possibility to explain the PV effect of Lobashov and others in the np implies d gamma reaction is found. (Atomindex citation 12:603747)

JINR-E-2-80-587 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Numerical Study of Properties of Many-Dimensional Soliton-Type Objects.
V. G. Makhankov, and A. B. Shvachka. 1980, 8p
International meeting on problems of mathematical simulation in nuclear physics research, Dubna, USSR, 1980.
U.S. Sales Only.

A brief review of the dynamical properties of many-dimensional quasi-solitons studied by means of the computer simulation in the framework of the nonlinear classical field theory models is presented. It is shown that the types of soliton interactions are model independent for studied models. (Atomindex citation 12:602783)

JINR-E-2-80-655 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Quantum Nonlocal Conserved Charges for Generalized Nonlinear sigma Models.
R. P. Zaikov. 1980, 7p
U.S. Sales Only.

The problem of existence of infinite sets of quantum nonlocal currents for generalized nonlinear sigma models is investigated. It is shown that the corresponding conserved quantum currents are obtained from classical currents by field substitution with corresponding renormalized quantum fields and by subtracting singular terms. These singular terms are determined from operator expansion at small distances by the product of operators Asub(mu) and X. An explicit form for the second conserved charge is given. (Atomindex citation 12:614450)

JINR-E-2-80-71 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Highest-Weight Representations of Sl(2, C) and Sl(3, C) Via Canonical Realizations.
G. Burdik, M. Havlicek, and P. Exner. 1980, 13p
U.S. Sales Only.

The infinite-dimensional representations of the sl(n+1,C)Lie algebras (maximal representations) constructed in the previous paper are studied on the two simpliest examples n=1.2. The sufficient condition for irreducibility of the maximal representations is proved to be also necessary in these cases. It is further shown that our method allows us to construct other set of infinite-dimensional irreducible highest-weight representations of sl(3,C), the so-called mixed representations, which cover some of the cases when the maximal as well as the standard highest-weight representations (Verma modules) are reducible. (Atomindex citation 11:566437)

JINR-E-2-80-750 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Grassmann Analyticity and Extended Supersymmetries.
A. S. Galperin, E. A. Ivanov, and V. I. Ogievetsky. 1980, 8p
U.S. Sales Only.

The aim of the paper is to inroduce a notion of Grassmann analyticity and to show how it helps to reduce the number of Majorana spinor variables. It is shown that already in the N=1 supersymmetry the chirality can be also interpreted as the analyticity. A complex superfield that satisfies the Cauchy-Riemann condition is shown to be analytic. It has been checked up that the hypercomplex coordinates form invariant spaces of the N=4 supersymmetry and of N=8 supersymmetry. (Atomindex citation 12:614451)

JINR-E-2-80-96 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Approximate Description of Multiple Scattering in Nucleus-Nucleus Collisions at High Energies.
R. Dymarz, and A. Matecki. 1980, 8p
U.S. Sales Only.

A new expression for the nucleus-nucleus elastic scattering profile functions is derived. The optical limit, rigid projectile and rigid target approximations are laid down as the basis of the calculations. The invariant differential cross sections for the exp 2 H- exp 12 C elastic scattering are presented. They prove the eo.uivalence of the rigid target and the smarm projectile approximations. At the same time the comparison with the complete multiple scattering calculations shows that for large momentum transfers (q exp 2) both the approximations considerably underestimate the effect of quasielastic shadowing. A symmetric version of the rigid nucleus approximation is presented. The example of its application to the exp 4 He- exp 4 He scattering shows that the agreement with the complete multiple-scattering calculations is quite satisfactory except for very large momentum transfers where some shadowing is still missing. (Atomindex citation 11:564071)

JINR-E-4-12815 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Scattering and Reactions in a Four-Nucleon System within the Framework of K-Matrix Formalism.
A. G. Baryshnikov, V. B. Belyaev, L. D. Blokhintsev, B. F. Irgaziev, and Yu. V. Orlov. 1979, 19p
U.S. Sales Only.

The multichannel K-matrix formalism is used to study the binary processes in four-nucleon systems. The K-matrix elements are approximated by Feynman diagrams corresponding to the one- and two- nucleon exchange mechanism. Calculations of differential cross sections for elastic and inelastic scatterings were provided in the MeV range for some NN potentials. In detail some nuclear reactions: exp 3 He(p,p) exp 3 He, exp 3 H(p,p) exp 3 H, exp 3 H(p,n) exp 3 He, D(d,p) exp 3 H, D(d,d)D are considered. It is concluded that the

theoretical data are in satisfactory agreement with the experimental data. (Atomindex citation 11:568222)

JINR-E-4-13030 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Application of the Approximate Four Body Equations to Description of the Elastic Scattering and Charge Exchange of Pions by exp 3 He Nucleus.
V. B. Belyaev, M. G. Sapozhnicov, and J. Wrzecionko. 1980, 12p
U.S. Sales Only.

In the framework of the approximate four body equations the elastic scattering and charge-exchange of pions on exp 3 He nucleus in the 68-208 MeV pion energy range is investigated. These equations differ from the description within the optical model with the first-order optical potential in two aspects. The equations are derived without the impulse approximation. The rescattering of pions on nucleus is taken into account in all orders. Basic equations are derived. The strong dependence of the obtained cross sections of elastic scattering on the form of parametrization of the elementary pi N interaction indicates the necessity of a more thorough study of pi -nuclear cross sections as functions of the off-mass-shell behaviour of elementary pi N amplitudes. The energy dependence of the charge-exchange cross section at the fixed scattering angle 115 deg displays a more sharp decrease with increasing energy than that observed experimentally. (Atomindex citation 11:564072)

JINR-E-4-80-28 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Study of Low-Energy Pion-Deuteron Scattering in the Method of Evolution with Respect to Coupling Constant.
V. B. Belyaev, D. A. Kirzhnitz, M. Kh. Khankhasaev, and N. Zh. Takibaev. 1980, 18p
U.S. Sales Only.

The method of evolution with respect to coupling constant (CCE) is applied to study the low-energy pion-nucleus scattering. A variant of the CCE-method with two different coupling constants is considered. An iteration procedure for calculation of the scattering amplitude is developed. At each stage of successive approximations the scattering matrix remains unitary. As an example the low-energy pion-deuteron scattering is considered. A rapid convergence of this iterative series for the pi d-scattering length to its exact value obtained by solving Faddeev equations is demonstrated. The pi d-phases in the static limit of the theory are calculated. The results obtained for the pi d-scattering phases indicate their high sensitivity to pi N-interaction parameters. Note that all basic relations corrected to the spin-isospin dependence can be applied for the pion scattering on heavier nuclei, e.q., exp 6 Li, which admit a two-cluster representation. (Atomindex citation 11:564073)

JINR-E-5-12859 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Asymptotic Functions and Multiplication of Distributions.
T. D. Todorov. 1979, 18p
U.S. Sales Only.

Considered is a new type of generalized asymptotic functions, which are not functionals on some space of test functions as the Schwartz distributions. The definition of the generalized asymptotic functions is given. It is pointed out that in future the particular asymptotic functions will be used for solving some topics of quantum mechanics and quantum theory. (Atomindex citation 11:571878)

JINR-E-6-80-427 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Nuclear-Orientation Studies of the 51.5-Min exp 167 Lu Decay.
S. Davaa, J. Dupak, M. Finger, T. I. Kracikova, and N. A. Lebedev. 1980, 23p
U.S. Sales Only.

Anisotropies of gamma -rays, emitted in the decay of exp 167 Lu, Tsub(1/2)=51.5 min, have been measured. The exp 167 Lu was oriented by the hyperfine interaction when the lutetium nuclei were included in a gadolinium matrix cooled to 15 mK temperature. A top-loading exp 3 He - exp 4 He dilution refrigerator capable of quickly cooling a short-lived sample was used. Multipole-mixing ratios have been evaluated for many transitions. The spin assignments have been made for a number of levels in exp 167 Yb and their parities have been deduced. In particular, an unambiguous 11/2 exp - assignment was made for the 571.5 keV level which was identified as the ground state of the 11/2 exp - (505) band observed by Lindblad. The rotational bands in exp 167 Yb are discussed. (Atomindex citation 12:603978)

JINR-E-7-12922 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Measurements of the Maximum alpha -Particle Energy at Forward Angles in the Reaction exp 22 Ne+ exp 197 Au.
E. Gierlik, A. M. Kalinin, R. Kalpakchieva, Yu. Ts. Oganessian, and Yu. E. Penionzhkevich. 1979, 8p
U.S. Sales Only.

The alpha spectrum has been measured for the exp 22 Ne+ exp 197 Au system at E/sub lab/=178 MeV. The reaction products emitted at 0 deg relative to the beam direction are analysed using a magnetic spectrometer and detected by means of a semiconductor delta E-E telescope. The measured alpha spectrum strongly differs from the one expected in the model of particle evaporation out of a compound nucleus. The experimentally measured maximum alpha -particle energy almost amounts to the maximum possible value calculated from the reaction energy balance. The obtained results are discussed from the point of view of the mechanism of production of high-energy alpha -particles. (Atomindex citation 11:564198)

JINR-E2-80-40 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Exact Classical Solutions in the Nambu-Jona-Lasinio Spinor-Field Model.
M. M. Enikova, and V. I. Karlukovski. 1980, 10p
U.S. Sales Only.

The Nambu-Jona-Lasinio spinor-field model in three-space and one-time dimensions is studied. The problem of derivation of plane-wave solutions of the field equation is univariate. The Hamiltonian formalism has been constructed for the corresponding dynamical system. It is shown that this system with four degrees of freedom is quite integrable. A large class of exact solutions to the classical field equations is found explicitly by varying transformation parameters of symmetries generated by motion constants in the involution. (Atomindex citation 11:566435)

JINR-R-1-12869 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Dispersions of the Multiplicity Distributions in the Interactions of Deuterons and alpha Particles with Emulsion Nuclei at 4.5 GeV/C Per Nucleon.
G. S. Shabratova. 1979, 8p
In Russian.
U.S. Sales Only.

Studied is the behaviour of the equare root of dispersions of the multiplicity distributions for secondary particles depending on the average number of the particles produced in interactions of relativistic nuclei of deuteron and helium with emulsion nuclei at the 4.5 GeV/c impulse per nucleon. It is shown that for nucleus-nucleus interactions averaged with respect to the impact parameter ("average" interactions) the data are close to the dependence for secondary pi exp - mesons from proton-proton interactions. For events with the definite impact parameter the behaviour of the dispersion square root as a function of the average particle number differs from the analogous dependence for proton-proton interactions. The results are in a good agreement with the calculations of nucleus-nucleus interaction as a superposition of nucleon-nucleon interactions. (Atomindex citation 11:568578)

JINR-R-1-12981 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Description of Charge and Rapidity Correlations in Anti Pp Interactions at 22.4 GeV/C Using the Quark-Parton Model.
B. V. Batyunya, I. V. Boguslavskii, and A. Valkarova. 1980, 12p
In Russian.
U.S. Sales Only.

Multiparticle correlations over charge and velocities in anti pp interactions at 22.4 GeV/c are compared with the predictions of quark-parton model. The indication is obtained that the particle clusterization in00.0 eal events manifests itself more distinctly as compared to events generated by the model. The trend to charge compensation along the rapidity scale in zone graphs terms is described by the quark-parton model quite satisfactorily. The discrepancy between experimental and model values of charge transfer asks for the introduction into the model of the possibility to recombine valence quarks with valence antiquarks. (Atomindex citation 11:567891)

JINR-R-1-13055 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Inelastic Interactions of 4.5 GeV/C Protons with Photoemulsion Nuclei.
B. P. Bannik, S. Vokal, and V. A. Leskin. 1980, 12p
In Russian.
U.S. Sales Only.

In inelastic collisions of protons with photoemulsion nuclei at 4.5 GeV/c data have been obtained on multiplicity of shower particles, energy spectrum of fast secondary protons with (2.5+-0.1) GeV average energy and energy spectrum of produced charged pions wth (640+-50) MeV average energy. The multiplicity, angular distributions and energy of particles arising from splitting target-nuclei are also determined. Proton spectrum is approximated by the degree dependence Esup(- gamma) at gamma =1.4+-0.1. Distributions of protons and pi -mesons over rapidities have been obtained. (Atomindex citation 11:568579)

JINR-R-1-80-15 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Double Charge Exchange Reactions of Negative Pions on Nuclei with Changing Strangeness.
Yu. A. Biryukov, M. G. Gornov, A. G. Drutskoi, S. V. Lapushkin, and K. O. Oganesyan. 1980, 7p
In Russian.
U.S. Sales Only.

The double charge-exchange reactions of negative pions on nuclei with changing strangeness (pi exp - +A implies K exp + +mp+n pi exp 0 ; pi exp - +A implies pi exp + +K exp 0 +mp+n pi exp 0 ; pi exp - +A implies K exp + +K exp 0 +mp+n pi exp 0 ; pi exp - +A implies pi exp + +K exp 0 +mp+n pi exp 0) have been investigated. The experiments were performed at the 105 cm freon bubble chamber at the MEPhI (Moscow) with a 3.9 GeV/c pions minus beam. The cross sections, the mass spectra of the produced particles and proton momentum spectra are presented. Intermediate resonance states are likely to play a substantial part in the reactions. The cross sections are quite measurable to study the reactions. The isobatic mechanism is a possible process responsible for the double charge-exchange reactions. (Atomindex citation 11:564200)

JINR-R-1-80-23 PC **A02/MF A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Experimental Check of the Nuclear Cumulative Effect Hypothesis.
V. S. Stavinskij. 1980, 8p CONF-800232-5
In Russian.International conference on extreme states in nuclear systems, Dresden, German Democratic Republic, 4 Feb 1980.
U.S. Sales Only.

Recent experimental data on the nuclear cumulative effect are shortly surveyed. In the main they relate to inclusive backward spectra of high energy particles under irradiation of nuclei with 8.9 GeV/cxN protons. It is seen from the data presented that the hypothesis prediction for the dependence of the invariant cross section on the mass number of a fragmentizing nucleus to level off is valid for pions beginning with A approximately 20, and for protons - with A approximately 100. The consequences of the hypothesis that at equal cumulative numbers the pion and kaon production cross sections are equal and dependences of emitted cumulative particles for light (helium) and heavy (lead) target nuclei are equal, have also found the experimental verification. Thus, a conclusion may be drawn that the angular and energy dependences of

the cumulative particle production cross sections are consistent. (Atomindex citation 11:564201)

JINR-R-1-80-537 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Study on the Meson Resonance Production in Pion-Carbon Interactions at 40 GeV/C.
N. S. Angelov, O. Balea, and V. Boldea. 1980, 9p
In Russian.
U.S. Sales Only.

Results have been obtained on the production cross sections of rho exp 0 , omega and f mesons in pi exp - 12 C interactions at 40 GeV/c. The average multiplication of these resonances are <n(rho exp 0)>=0.47+-0.05, <n(omega)>=0.50+-0.06 and <n(f)>=0.05+-0.05. The transverse momentum square distribution of rho exp 0 mesons is well described by an exponential having the slope of 2.7+-0.4 (GeV/c) exp -2 . The behaviour of <n(rho exp 0)> vs rapidity in pi exp -12 C and pi p interactions is different. This fact can be explained in the framework of the additive quark model. (Atomindex citation 12:603979)

JINR-R-1-80-55 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Two-Particle Correlations Between Secondary Protons in the pi exp -12 C Interactions at 40 GeV/C.
N. Angelov, N. Akhababyan, O. Balea, V. Boldea, and V. G. Grishin. 1980, 10p
In Russian.
U.S. Sales Only.

Two-particle coprelations between secondary protons arising from pi exp -12 C-interactions at 40 GeV/c are studied. Different effects are observed of interaction of protons in the final state at small differences of their momenta delta p=Vertical Barp sub 1 vector-p sub 2 vectorVertical Bar<0.100 GeV/c. For protons smaller than 200 GeV related to the carbon nucleus destruction, a destructive correlation, which is due to the Coulomb repulsion between the partic--les and their identity, is observed. For protons with momenta larger than (200-300) GeV/c, produced in multiple inelastic collisions of the incident pion with the nucleons of the target nucleus, a constructuve correlation, connected with the nuclear attraction between the rotons, is observed. (Atomindex citation 11:564202)

JINR-R-1-80-59 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Neutron Form Factors (Data Analysis on Ed Elastic Scattering).
S. I. Bilen'kaya, and Yu. M. Kazarinov. 1980, 8p
In Russian.
U.S. Sales Only.

The analysis of data on the elastic electron scattering by deuterons in the 0.3F exp -2 <= q exp 2 <= 34.1F exp -2 range has been carried out in order to obtain information on electromagnetic neutron form factors. It is shown that the data can be described under the assumption that scaling relations between isovector and isoscalar form factors take place. In this case the derivative dGsub(E)sup(n)qsup(2)/dqsup(2))Vertical Barsub(qsup(2))=0 ((Gsub(E)sup(n)(qsup(2)) is charge neutron form factor) coincides in sign and is similar in value to that obtained in the experiment on slow neutron scattering on electrons. (Atomindex citation 11:568223)

JINR-R-1-80-593 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Study on Dimensions of the Region of Secondary Negative Pion Emission in pi exp - p, pi exp - N and pi exp - C Interactions at 40 GeV/C.
N. Angelov, N. Akhababyan, O. Balea, V. Boldea, and V. G. Grishin. 1980, 12p
In Russian.
U.S. Sales Only.

Space-time characteristics of the region of negative pion emission in the pi exp - p, pi exp - n and pi C interactions at 40 GeV/c in lab.c.s. are determined by the identical pion interferency. In pion-nucleon interactions the radius of the region of negative pion emission r is equal to 1.9+-0.3 Fm, and the lifetime of the excited region tau =0.8+-0.2 Fm. For pion-carbon interactions these values are following: r = 3.4+-0.5 Fm, tau = 4.5+-2.1 Fm. It is found that in pi exp - C interactions these characteristics depend on transverse momenta of secondary pions and on a number of interacting nucleons of a target nucleus r being smaller with the increase of pion transverse momenta. (Atomindex citation 12:603748)

JINR-R-11-80-93 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Computer Calculation of the S Matrix Elements in the Nonlocal Quark Model.
E. P. Zhidkov, and Yu. Yu. Lobanov. 1980, 12p
In Russian.
U.S. Sales Only.

A short description of computer programs written in SCHOONSCHIP is given. The programs are assigned for obtaining by computer an expression of the S-matrix element to nonlocal quark model proceeding from the Lagrangians of interaction and for transformation of this expression to the form, necessary for the numerical calculations. Some results on the use of programs are given. (Atomindex citation 11:566439)

JINR-R-15-80-416 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Duration Time of Uranium-238 Nucleus Fission Induced by Helium-4 Ions.
V. N. Bugrov, V. V. Kamanin, and S. A. Karamyan. 1980, 12p
In Russian.
U.S. Sales Only.

The shadow-effect minima in fission-fragment angular distributions are observed and quantitatively studied in the experiments on monocrystalline UO sub 2 target irradiations by the exp 4 He ion beam with the 23, 25, 26, 28, 30, 33, and 35 MeV energy. Time delay of fission events is found in the consideration of the measured values of the shadow minimum yield X exp 150 and the difference of minimum yield delta sub(X). The energy dependence of X exp 150 and delta sub(X) corresponds to model-calculation results with parameters taken from experimental data available. (Atomindex citation 12:603902)

JINR-R-2-12440 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Electromagnetic Trident Production in Deep-Inelastic mu N Scattering.
A. A. Akhundov, D. Yu. Bardin, N. D. Gagunashvili, and N. M. Shumeiko. 1979, 14p
In Russian.
U.S. Sales Only.

Carried out is the model-independent analysis of the contribution of various electromagnetic mechanisms (EMM) of interaction of virtual photon with the target (elastic, quasielastic and deep-inelastic) into measured cross sections of multimuon events of the mu +Z implies mu + mu exp + + mu exp - +x type. Studied are the sensitivity of cross sections of trident processes to the form factors and structural functions selection as well as the relative contribution in the cross sections of various diagrams. Results of EMM contributions in total and integral cross sections for scattering of 250 GeV energy muons on hydrogen and carbon calculated by the Monte-Carlo method are presented. A conclusion is made that while processing the experimental information on multimuon events all EMM interactions should be taken into account. Within the limits of the achieved accuracy of calculations total and integral cross sections are not sensitive to the selection of form factors and of structural functions. (Atomindex citation 11:567746)

JINR-R-2-12814 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Contribution of Lepton Pair Electromagnetic Production to the Inclusive Cross Section of Deep Inelastic mu p Scattering.
A. A. Akhundov, D. Yu. Bardin, and N. M. Shumeiko. 1979, 12p
In Russian.
U.S. Sales Only.

The contribution of processes of electromagnetic production of l exp + l exp - pairs to a measured cross section of deep inelastic mu p scattering has been calculated. Processes of mu +p implies mu +e exp + +e exp - +p and mu +p implies mu +e exp + +e exp - +hadrons have been considered. Inclusive cross sections of the mu +p implies mu + mu exp + + mu exp - +X and mu +p implies mu +tau exp + +tau exp - +X interactions have been calculated too. It has been found that in a greater part of kinematical region radiative corrections, due to this contribution, do not exceed 0.4 per cent. (Atomindex citation 11:567750)

JINR-R-2-12941 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Stability of Particle-Like Formations. 1. Scalar Electrodynamics. The Stability of the Coulomb Field of an External Source.
Yu. V. Katyshev, N. V. Makhaldiani, and V. G. Makhan'kov. 1979, 12p
In Russian.
U.S. Sales Only.

The stability of long-range Coulomb field of cylindrically symmetric external source in 2+1 dimensional scalar electrodynamics is proved. The approximate solutions of the equation of small fluctuation of scalar field is obtained. The same equation is solved by numerical computation, the results is in good agreement with the same considerations in 1+1 and 3+1 dimension is made. (Atomindex citation 12:602784)

JINR-R-2-80-160 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Study on the Reactions Describing Properties of Hadron Systems in Deep Inelastic Processes.
Ya. Z. Darbaidze, and N. V. Makhaldiani. 1980, 15p
In Russian.
U.S. Sales Only.

In the framework of multicharge modal of quantum field theory applying the principle of maximal automodelity in multiplicity the analysis of the scaling relations for structure functions, differential cross sections in the deep inelastic neutrino and hadron-hadron processes has been performed. Some relations between the characteristics of exclusive and semi-inclusive channels are proved. The correlations between neutral and charged particles are studied. The automodel expression in the longitudinal and transverse rapidities are analysed. The power behaviour which does not contradict the quark-parton form for cross section is derived in all exclusive channels. (Atomindex citation 11:567751)

JINR-R-2-80-428 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Dimensional Regularization with a Model Which Leads to a Radial Schroedinger Equation.
V. A. Gribov. 1980, 13p
In Russian.
U.S. Sales Only.

A problem of quantum field theory is considered which leads, under some assumptions, to a radial Schroedinger equation With potential V(x)=csup(2)xsup(-(n-2)). Its exact solution regular at x=0 is, up to an infinite normalization factor, continuous in space dimensionality n at n=4. For this solution a finite part of the perturbation series in coupling constant c exp 2 is free of divergences for n<4 and at n implies 4-0 turns up to the infinite normalization factor, into the corresponding part of c exp 2 -expansion of the exact solution in the 4-dimensional case. Analogous results are obtained for the Schroedinger equation that in the 4-dimensional case contains a logarithmic-type singular potential. Thus the applicability of dimensional regularization is proved for the cases considered. (Atomindex citation 12:602787)

JINR-R-2-80-436 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Global Structure of the General Solution of the Chew-Low Equations.
V. P. Gerdt. 1980, 12p
In Russian.
U.S. Sales Only.

The Chew-Low equations for static p-wave pi N-scattering are considered. The equations are taken as a system of three nonlinear difference eqUations of the first order which have the general solution depending on three arbitrary periodic functions. An approach is

suggested to the global construction of the general solution based on the power series expansion over one of the arbitrary functions C(w), determining the structure of an invariant curve for the Chew-Low equations. It is shown that the initial nonlinear problem is reduced to the linear one in each order over C(w). By solving the linear problem the general solution is found in the first-order approximation in C. (Atomindex citation 12:602788)

JINR-R-2-80-519 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Physical Constants and Invariant Charges of the U(1) X SU(3).
A. V. Efremov, S. V. Ivanov, and V. A. Nesterenko. 1980, 11p
In Russian.
U.S. Sales Only.

A type of invariant charges in a unified model of strong and electromagnetic interactions is investigated. The asymptotic properties of interaction constants of the Higgs sector are considered. The dependence of invariant charges momentum square transfered is stated not to contradict the restrictions to mode parameters following from experiments on checking quantum electrodynamics. (Atomindex citation 12:603749)

JINR-R-2-80-53 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Method of Accuracy Estimation of the Rigid Nucleus-Pro Ectile Approximation.
I. U. Khristova, Z. Omboo, A. S. Pak, and A. V. Tarasov. 1980, 4p
In Russian.
U.S. Sales Only.

A method of evaluating accuracy of the rigid nucleus-projectile approximation is proposed which uses mathematically equivalent approximations while going from two precise and identical expressions for the alpha A elastic scattering amplitudes in the eikonal theory of the nucleus-nucleus scattering to approximate ones. A discrepancy between the expressions determines the accuracy of the approximation. As an example the alpha A(A= exp 12 C, exp 27 Al, exp 64 Cu) elastic scattering cross sections have been calculated at several GeV/nucleon as a function of momentum transfer. It is shown, that the accuracy of the rigid nucleus-projectile approximation deteriorates with increasing momentum transfer, the accuracy being the worse the lighter the target. (Atomindex citation 11:564074)

JINR-R-2-80-54 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Cross Sections of Quasi-Elastic Nucleus-Nucleus Scattering in the Optical Approximation.
I. U. Khristova, Z. Omboo, A. S. Pak, A. V. Tarasov, and V. V. Uzhinskii. 1980, 4p
In Russian.
U.S. Sales Only.

The close expression for the differential cross section of quasi-elastic nucleus-nucleus scattering is obtained in the optical-limit approximation, neglecting the real part of the NN-scattering amplitude. (Atomindex citation 12:603903)

JINR-R-2-80-568 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Noneuclidean Momentum Space and the Two-Body Problem.
A. D. Donkov, V. G. Kadyshevskii, and M. D. Mateev. 1980, 15p
In Russian.
U.S. Sales Only.

In the framework of quantum field theory with De Sitter momentum space a quasipotential equation for the two-particle system is obtained. The equation is solved in quasiclassical approximation. The large angle scattering, similarly to the usual approach, is considered as scattering on a smooth quasipotential in the region of the classically forbidden angles. (Atomindex citation 12:602789)

JINR-R-2-80-570 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Parton State Mixing and the Real Part of the Amplitude of High-Energy Hadron-Nucleus Elastic Scattering.
B. Z. Kopeliovich, and L. I. Lapidus. 1980, 5p
In Russian.
U.S. Sales Only.

The mixing of the parton components of a relativistic hadron propagating through a nucleus is treated in a simple two-channel model. Such mixing leads to the considerable value of the real part of the hadron-nucleus elastic scattering amplitude at high energies, which has the negative sign. This effect can be considered also as a result of the inelastic shadowing in a nucleus. (Atomindex citation 12:603904)

JINR-R-2-80-588 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Coupled Channel Potentials of the Bargmann Type.
B. N. Zakhar'ev, E. B. Plekhanov, and A. A. Suz'ko. 1980, 6p
In Russian.
U.S. Sales Only.

A significant simplification of exact solutions for coupled channel equations (with interaction matrices of the Bargmann type), which has been considered previously by Cox (1964) in the Marchenko approach and by Zakhariev et al. in R-matrix approach, is presented. It is achieved due to additional "degeneration" (with respect to channel indices) of the kernel of the inverse problem integral equation, to which no attention has been paid before. (Atomindex citation 12:602790)

JINR-R-2-80-659 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Deep Inelastic Compton Scattering as a Test for a Model with Integer Charged Quarks.
A. V. Efremov, S. V. Ivanov, and S. V. Mikhailov. 1980, 4p
In Russian.
U.S. Sales Only.

The conditions of employing the parton model for the gamma N implies gamma X process are investigated. Characteristics are determined, measurements of which will be the best test in the model with breaking of colour symmetry. In the framework of the unified model with integer charged quarks available experimental data on deep inelastic Compton scattering of photons on protons are analysed. In the base of diagrams which takes place in the unified model the cross section of the gamma N implies gamma X reaction with account for quark and gluon contributions is obtained. (Atomindex citation 12:603750)

JINR-R-2-80-683 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Vector Representation of Lorentz Group.
A. A. Leonovich, and A. B. Pestov. 1980, 6p
In Russian.
U.S. Sales Only.

A theorem about the conservation of tensor probability current in the theory of vector field interacting with electromagnetic and nonabelian calibration field is proved. In this way the problem is solved on correct setting a question on vector particle motion in external field of indicated type. (Atomindex citation 12:614453)

JINR-R-3-12999 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Search for Anomalous alpha -Widths in the exp 147 Sm(N, alpha) exp 144 Nd.
A. Antonov, A. A. Bodzel, Yu. M. Gledenov, S. Marinova, and Yu. P. Popov. 1980, 12p
In Russian.
U.S. Sales Only.

The results are presented of investigation of the exp 147 Sm(n, alpha) exp 144 Nd reaction with resonance neutrons in order to search for resonances with large alpha -widths. Total alpha -widths from the exp 147 Sm(n, alpha) exp 144 Nd up to 700 eV with a resolution of 4 ns/m together with averaged cross sections of the reaction up to 3 KeV were measured. The experiment reveals a noticeable fluctuation of cross sections averaged over 100 eV intervals. In the region up to 3.2 keV at least 5 resonances were found having resonance alpha -widths large than the mean alpha - width by an order of magnitude. The probability of their occurrence is in agreement with the orediicted within the statistical theory chi exp 2 distribution of alpha - widths. (Atomindex citation 11:568580)

JINR-R-3-13000 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Further Search for High Energy Neutrons of Heavy Nucleus Fission.
A. B. Popov, V. T. Rudenko, and G. S. Samosvat. 1980, 7p
In Russian.
U.S. Sales Only.

The method of radioactive indicators using threshold (n,xn) reactions was applied for further search for high energy part of neutron fission spectrum. Monoisotope element- exp 209 Bi was used as an irradiated specimen. Registration of the reaction products was performed by Ge(Li)-detector. It was stated, that up to the energy not less, than 30 MeV the neutron fission spectrum approximately followed Maxwell distribution. The neutron yield in 40-60 MeV range did not exceed approximately 4x10 exp -10 per division. (Atomindex citation 11:568581)

JINR-R-3-80-135 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Isomer Shift of Neutron Resonances. Pt. 4. The Change of the exp 238 U Mean-Square Charge Radius on Resonance Neutron Capture.
W. Seidel, A. Meister, D. Pabst, and L. B. Pikel'ner. 1980, 10p
In Russian.
U.S. Sales Only.

Isomer chemical shift in the 6.68 eV resonance in exp 238 U is measured on the IBR-30 neutron spectrometer. The measurements were performed for 5 different chemical compounds. The change of the nuclear mean-square charge radius caused by the neutron capture at this resonance level is deduced and are found to be delta <rsub(p)sup(2)>=-(1.7+1.2-0.8) Fm exp 2 . The results obtained could be interpreted as deformation diminishing at the nuclear excitation up to 5 MeV energy. (Atomindex citation 11:568582)

JINR-R-3-80-19 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Neutron Distribution at the Nuclear Spontaneous Fission.
K. D. Tolstov. 1980, 7p
In Russian.
U.S. Sales Only.

The results of experiments on neutron distribution at the spontaneous fission of exp 288 U and exp 252 Cf are analysed. It is shown that these distributions are described by the superposition of binomial distributions for neutrons emitted from fission fragments. It is shown that the value of average neutron number for unknown spontaneous emitter is within 3 <= anti nu <= 5, which points to exp 252 Cf. It is shown that modelling of neutron distributions over multiplicity by means of binomial or superposition of these two distributions gives more unambiguous results as compared to the statistical regularization method applied earlier for spontaneous fission of fermium isotopes. (Atomindex citation 11:564203)

JINR-R-3-80-34 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
Search for One-Pion Exchange in the Low Energy Neutron Scattering on Nuclei.
Yu. A. Aleksandrov, G. G. Bunatyan, V. G. Nikolenko, A. B. Popov, and G. S. Samosvat. 1980, 4p
In Russian.
U.S. Sales Only.

Angular dependence of scattering of keV neutrons in odd In, J, Bi nuclei and on neighbouring mostly even Gd, Te, Pb nuclei, is measured. The 20-30% difference of p-amplitudes of nuclear pairs investigated has been observed. The possibility is discussed of interpreting this difference by one-pion exchange between an incident neutron and odd nuclear nucleon. (Atomindex citation 11:564204)

JINR-R-4-12773 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Calculation of Quadrupole Deformation and the Moment of Inertia in Rotating Nuclei.
I. N. Mikhailov, Kh. L. Molina, and R. G. Nazmitdinov. 1980, 9p
In Russian.
U.S. Sales Only.

The relation between the parameters in the model describing the spectra of excited states in rotating nuclei and the parameters in the cranking model is established. This is done writting the Hamiltonian as a polynomial depending on the angular momentum operator squared with the residual quadrupole and pairing interaction. The theoretical scheme is developed to investigate the quadrupole deformations, the pairing energy gap and the moment of the inertia in the region of yrast-line. (Atomindex citation 11:568224)

JINR-R-4-12793 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Calculation of the Low-Energy Characteristics of Pion Scattering on exp 3 He and exp 4 He Nuclei.
V. B. Belyaev, A. L. Zubarev, and A. Rakhimov. 1979, 10p
In Russian.
U.S. Sales Only.

Within the strong coupled channel method, reformulated by means of the Schwinger variational principle the phase shifts and scattering lengths were calculated for the elastic scattering of pions by the nuclei exp 3 He and exp 4 He (E/sub pi / < = 28 MeV). In the calculations the pi N potentials corresponding to the three existing sets of the experimental data were used. The contribution to the scattering lengths from virtual transitions into the continuum spectrum of the nuclear system was estimated. Neglecting such transitions changes the scattering lengths in the following manner: pi exp -4 He by 48%, pi exp +3 He by 30% and pi exp -3 He by an order of three. (Atomindex citation 11:564075)

JINR-R-4-12916 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Energy Dissipation in Heavy-Ion Reactions in the Framework of the Potential Model.
G. N. Afanas'ev, A. G. Gal'perin, M. B. Dobromyslov, V. P. Permyakov, and V. M. Shilov. 1979, 12p
In Russian.
U.S. Sales Only.

The one-dimensional quantum model which takes into account the energy dissipation in heavy ion reactions is presented. The dissipation is due to intrinsic excitations of the compound system which are identified as the giant resonance modes. In the framework of this approach the dependence of fusion cross section on the incident energy and energy losses is analyzed. (Atomindex citation 11:568225)

JINR-R-4-12986 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Radiative Capture of Polarized Muons Minus on exp 16 O and exp 40 Ca Nuclei.
M. Gmitro, S. S. Kamalov, T. V. Moskalenko, and R. A. Ehramzhyan. 1980, 8p
In Russian.
U.S. Sales Only.

The coefficient of asymmetry of the GITA(k) photon angular distribution (with respect to muon spin) and Psub(gamma)(k) photon circular polarization have been calculated for the case of radiative capture of polarized muons on exp 16 O and exp 40 Ca. Nuclear states are treated in a microscopic model. Two particle-two hole configurations have also been included for exp 16 O. The calculations were performed in the impulse approximation framework. The effects of nucleon-velocity-dependent terms in the effective Hamiltonian are studied quantitatively. The characteristics of the nuclear radiative muon capture are obtained by summing the contributions of individual partial transitions (disregarding the contributions of the weakly excited states) rather than by using the closure approximation. Studies carried out has shown that studied characteristics are weakly sensitive to the choice of nuclear wave functions. (Atomindex citation 11:568226)

JINR-R-4-12996 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Effect of the Nuclear Structure on the Imaginary Part of the Optical Potential in Odd exp 27 Al, exp 121 Sb, exp 123 Sb and exp 197 Au Nuclei.
J. L. Molina. 1980, 6p
In Russian.
U.S. Sales Only.

The relation between the imaginary part of the optical potential for neutron elastic scattering and low-lying-state nuclear structure is studied in the odd exp 27 Al, exp 121 Sb, exp 123 Sb and exp 197 Au nuclei. The imaginary part of the optical potential W which corresponds to inelastic channels, is expanded over intermediate states of nucleon-nucleus system. The contribution to W of the target-nucleus low excited states has been calculated. The state wave functions of odd-nuclei are described in the framework of the particle core coupling model. It is shown that in all the studied nuclei the theoretical angular dependence of W is in a satisfactory agreement with similar dependence of the phenomenological potential with the rank of nonlocality 1f. The largest contribution to W comes from the lowest collective excited states. (Atomindex citation 11:568227)

JINR-R-4-12997 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Effect of Particle-Hole Correlations on the Imaginary Part of the Optical Potential in exp 16 O and exp 40 Ca Nuclei.
J. L. Molina. 1980, 6p
In Russian.
U.S. Sales Only.

The effect of particle-hole correlations on the imaginary part of the optical potential (ImVsub(opt)) for neutron elastic scattering through intermediate inelastic channels is studied in the exp 16 O and exp 40 Ca nuclei. The contributions to ImVsub(opt) of the target-nucleus collective states have been calculated. The structure of these states is described within the framework of the Tamm-Dankof (TDA) and Random-Phase (RPA) approximations. The numerical calculations have been performed for 14 MeV energy of the entrance channel by employing delta-force two-body residual interaction. As it is shown by the results of calculations, the contribution to ImVsub(opt) of the lowest 3 sub 1- collective state significantly increases when the particle-hole correlations are taken into account. This leads to a notable better agreement of the theoretical angular dependence of IMVsub(opt)(THETA) with the corresponding part of the nonlocal phenomenological potential. (Atomindex citation 11:568228)

JINR-R-4-80-173 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Description of Collective Excitations of Rotational Nuclei in the Realistic Model.
J. L. Molina. 1980, 18p
In Russian.
U.S. Sales Only.

A scheme for the description of one-phonon quadrupole collective states over the yrast line in a wide region of the angular momentum is presented. Many difficulties of calculation arising with the rotation can be removed by an average description within the strength function method. The strength function of the reduced probability of electric quadrupole transitions from the phonon-vacuum (yrast line) to the RPA one-phonon states with positive and negative signature have been calculated until the angular momentum 50 h/2 pi in the exp 168 Yb nucleus. This method allows us, without much computer time, to observe the evolution of the collective low-lying states (gamma and beta vibration, mode) with changing spin. For spins > or approximately 16 h/2 pi a very strong mixture of states with different z-projections K of the angular momentum (delta K= +-1), and also a great loss of collectivity of gamma - and beta vibrational states have been observed. (Atomindex citation 11:568229)

JINR-R-4-80-37 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Preequilibrium Emission of Light Particles in Heavy Ion Reactions.
R. V. Dzholos, and V. G. Kartavenko. 1980, 11p
In Russian.
U.S. Sales Only.

A model of the process of emission of light particles in heavy ion reactions taking account of the evolution of system from nonequilibrium to equilibrium state is proposed. The comparison of theoretical results with experimental data on energy and angular dependence of the cross section of alpha particles emission in exp 197 Au+ exp 22 Ne reaction indicates that the model does not contradict to experimental data. The slope of high energy part of spectrum and angular anisotropy are reproduced qualitatively. (Atomindex citation 11:568230)

JINR-R-4-80-401 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Coriolis Interaction and Electric Properties of Rotational States of exp 169 Yb.
J. Kvasil, T. Khazratov, and V. Choriev. 1980, 10p
In Russian.
U.S. Sales Only.

Electric properties of the exp 169 Yb nucleus are analyzed within the quasiparticle-phonon model allowing for the Coriolis interaction. The energy of rotational states and reduced probabilities of E2-and M1-transition are well described by this model. (Atomindex citation 12:603905)

JINR-R-4-80-44 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Checking of Axel-Brink Hypothesis for Deformed Nuclei in Quasiparticle-Phonon Nuclear Model.
V. Kitipova, L. A. Malov, and N. Yu. Shirikova. 1980, 12p
In Russian.
U.S. Sales Only.

The Axel-Brink hypothesis about the form of giant resonances constructed on excited states of atomic nuclei is investigated for even-even deformed nuclei within the framework of quasiparticle-phonon model. The main attention has been payed to the giant resonance range, force distribution of which for deformed nuclei is determined by nuclear deformation and force of the residual interaction. Changes of the force function outside resonance range, particularly, in the range of neutron binding energy, will be, obviously, more sensitive to the effect of complex configurations, phonon basis cutoff and other effects. It is necessary to take into account in the calculation of radiation force functions of neutron resonances. Calculations, performed for the electric dipole transitions in exp 176 Hf and exp 156 Gd have proved the Axel-Brink hypothesis, in case, when the low-lying state is close structurally to the one-phonon state. (Atomindex citation 11:568231)

JINR-R-4-80-509 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Giant Dipole Resonance in Fast-Rotating Nuclei.
A. V. Ignatyuk, and I. N. Mikhailov. 1980, 14p
In Russian.
U.S. Sales Only.

The properties of the giant dipole resonance in fast rotating nuclei are studied. The random-phase-approximation method is used applied to the hamiltonian including the oscillator average field and the factorized isovector and quadrupole forces. The splitting of the modes of the resonance is described which is generated by the rotation. The angular momentum dependence of the reduced probabilities of the dipole E1-transitions from the giant resonance states to yrast ones is investigated. As the dipole resonance plays a determining role in the formation of spectral intensity of an evaporative component of radiation transitions in highly excited nuclei, the accountancy of the effects under discussion is of interest both for refining the description of experimental data on electromagnetic deexcitation of fast-rotating nuclei and for the further development of the theory of high-spin states of nuclei. (Atomindex citation 12:603906)

JINR-R-5-80-479 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Sufficient Condition for the Existence of a Particle-Like Solution for Some Field Models. Pt. 1.
I. V. Amirkhanov, and E. P. Zhidkov. 1980, 16p
In Russian.
U.S. Sales Only.

An investigation of nonlinear equation d exp 2 phi(x)/dx exp 2 -(eta exp 2 +l(l+1)/x exp 2)phi(x)=-phi(x)F(phi exp 2 (x), x), eta > 0 for boundary conditions phi(0)=phi(infinity)=0 is performed. Equation (1) for zero value of parameter l was investigated by many authors before. Arbitrary integer value of l is considered. By means of variational approach the following main theorem is proved. If the conditions (1a)-(1d) for function F(phi exp 2 (x), x) are completed, then there exist Positive Particle-Like solutions of the boundary value problem (1)-. (Atomindex citation 12:602794)

JINR-R-6-12849 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Exp 155 Er beta Decay and exp 155 Ho Excited Levels.
A. Budzyak, N. Ganbaator, I. Zvol'ski, K. Zuber, and V. G. Kalinnikov. 1979, 12p
In Russian.
U.S. Sales Only.

Gamma-ray, internal conversion electrons, gamma-gamma-and electron-gamma-coincidences spectra and those of delayed gamma-gamma coincidences are investigated. exp 155 Er isotope is obtained in the reaction of tantalum profound splitting with the protons with the 660 MeV energy. exp 155 Er gamma-ray spectra have been investigated with the spectrometer with Ge(Li)-detectors. Spectra of exp 155 Er internal conversion electrons have been measured with the iron-free beta-spectrometer with the toroidal magnetic field. The spectra of gamma-gamma coincidences have been investigated using the device with two Ge(Li)-detectors. Electron-gamma coincidences have been measured using the device, created on the base of iron-free beta-spectrometer with the toroidal magnetic field and the spectrometer with Ge(Li)-detector. The data obtained are presented in a table. About 50 gamma-transitions accompanying exp 155 Er beta-decay have been discovered. Types of multipolity have been established for 10 transitions. The exp 155 Er implies exp 155 Ho decay scheme is proposed. The existence of 142.0 keV 11/2 exp - isometric state with Tsub(1/2)=0.88 ms has been determined in exp 155 Ho nucleus 110.1 keV, 7/2 exp + and 230.4 keV, 9/2 exp - states have been also identified in this nucleus, thus leading levels of the known from nuclear reactions developed bands have been established. The properties of exp 155 Ho levels under the assumption of a week deformation are discussed. (Atomindex citation 11:568583)

JINR-R-6-12944 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Lifetimes of exp 167 Yb Excited States.
B. A. Alikov, N. Z. Marupov, K. M. Muminov, T. M. Muminov, and U. S. Salikhbaev. 1980, 8p
In Russian.
U.S. Sales Only.

Lifetimes of exp 167 Yb excited states arising at the decay of exp 167 Lu implies exp 167 Yb monoisotope have been determined using e gamma and gamma gamma delayed coincidence methods. The time spectrometers mounted on the base of a magnetic lens beta -spectrometer and a scintillation detector, a scintillation and a Ge(Li) detectors, a scintillation and Si(Li)-detectors are used. exp 167 Yb level fifetimes are measured with energies of 29 keV (Tsub(1/2)=13.5(7) ns), 78 keV (Tsub(1/2=0.84(4) ns), 178 keV (Tsub(1/2)<=0.2 ns), 188 keV (Tsub(1/2)=28.0(25 ns), 213 keV (Tsub(1/2=0.27(3) ns), 239 keV (Tsub(1/2<=0.2 ns), 258 keV (Tsub(1/2)=0.34(5) ns), 278 keV (Tsub(1/2)<=0.2 ns) and 440 keV (Tsub(1/2)<=0.2 ns). The probabilities of electromagnetic transitions discharging the exp 167 Yb investigated levels are analysed. On the basis of intrarotational transitions internal quadrupole momenta of 5/2 exp - /523/, 3/2 exp - /512/ and 1/2 exp - /521/ bands have been determined. (Atomindex citation 11:568584)

JINR-R-6-80-369 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Study on the exp 121 Te Excited States from exp 121 I Decay.
N. A. Bonch-Osmolovskaya, 1980, 10p
In Russian.
U.S. Sales Only.

To specify the exp 121 I decay scheme, gamma spectra from decay have been measured. By means of spectrometer with a Ge(Li) detector. On the basis of experimental and literature data analysis, the exp 121 Te excited-states scheme has been specified and added; 9 new transitions have been found. The introduction of 806-, 887-, 912-, and 994-keV states has been well grounded; the previously suggested 889- and 1409-keV states are not confirmed. New levels at 1173 and 1485 keV have been found. From 71 transitions observed, 69 are placed in the exp 121 I specified decay scheme. Within the framework of the constructed decay scheme, level populations have been calculated. (Atomindex citation 12:603980)

JINR-R-7-12802 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Statistical Analysis of Fission Probability of Preactinide Nuclei in the (Exp 12 C, F) Reaction.
S. D. Beizin, M. G. Itkis, V. N. Okolovich, Yu. A. Muzychka, and B. I. Pustyl'nik. 1979, 20p
In Russian.
U.S. Sales Only.

Presented are the analytical results on experimental data on fission cross sections and angular distributions of fission fragments of compound nuclei formed on irradiation of Er, Yb, Hf, W and Os targets by exp 12 C ions in the energy range from the interaction barrier to 110 MeV. The calculation method is based on statistical consideration of deexcitation process of the compound nuclei. Fission of the compound nucleus and product nuclei after neutron, proton and alpha -particle escape are taken into account. It is assumed that every neutron in the course of evaporation carries away the angular moment of 2h, proton - 3h, alpha - particle - 10h. The calculations are carried out using the ALICE program with a number of alterations. The fission cross sections, angular fragment distribution, isotope production cross sections in evaporation channels, ratio of the widths for every cascade stage are calculated for every reaction. (Atomindex citation 11:568232)

JINR-R-7-80-60 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Nuclear Interaction Potential in the Heavy Ion Reactions.
Kh. L. Molina, and K. V. Shitikova. 1980, 8p
In Russian.
U.S. Sales Only.

The interaction potential of heavy ions exp 4 He, exp 6 Li, exp 12 C and exp 16 O is constructed in the folding model. The density of nuclear matter distribution for these nuclei is calculated in the framework of the hyperspherical function method. For the calculation of the folding potential the Skyrme two-body nucleon-nucleon forces were employed. The influence of several effects on the results of calculation is studied. Density dependence of the nucleon-nucleon interaction, dependence of the folding potential on the number of particles, the potential symmetry in the interaction of identical and different particles and the possibility of observing the monopole-resonance in the ion inelastic scattering are investigated. The investigations showed that the higher is the nuclear excitation energy the wider and shallower is the form of a potential. Nondiagonal matrix elements are not negligible. (Atomindex citation 11:568233)

JINR-1-80-294 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Pi exp + -Meson Production in Low-Energy Proton Collisions with Carbon and Copper Nuclei.
Yu. K. Akimov, I. I. Gaisak, F. F. Guber, V. A. Krasnov, and A. B. Kurepin. 1980, 14p
In Russian.
U.S. Sales Only.

Differential and double differential cross sections of positive pion production by 240 MeV protons on carbon and copper nuclei are measured. The energy dependence of differential cross section for copper nucleus at 90 deg angle within the 240-500 MeV energy range of protons and angular dependence of the integrated differential cross section are obtained. It is shown that the differential cross section at 250 MeV is 80 times less than that at 585 MeV. (Atomindex citation 12:603975)

JINR-1-80-361 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Experimental Set-Up for Exclusive Study of DP Interactions with Cumulative Proton Output.
V. F. Vishnevskii, and V. V. Glagolev. 1980, 10p
In Russian.
U.S. Sales Only.

The experimental set-up for exclusive study of dp interactions accompanied by the output of cumulative protons at 10 GeV/c using the resonance installation based on a streamer chamber with a liquid hydrogen target is considered. Estimates of effectivity of a trigger, background conditions and the accuracy of determining NN-and pi N-effective masses are obtained by simulation. (Atomindex citation 12:603976)

JINR-1-80-488 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Experimental Data on Cumulative Production of Positive and Negative Kaons in p-Pb Interaction.
A. M. Baldin, V. K. Bondarev, and N. Ghiordanescu. 1980, 4p
In Russian.
U.S. Sales Only.

Cross sections of cumulative K exp + and K exp - - meson production in the 200-1000 MeV kinetic energy range at 90 deg, 120 deg, 168 deg (l.c.s.) are measured. The ranges of kinetic energies and emission angles mean that, according to the hypothesis of cumulative effect, the incident proton (8.9 GeV/c) interacts with a mass of a target which corresponds to 1.5-3.3 nucleon masses (the order of cumulativity). (Atomindex citation 12:603977)

JINR-2-80-142 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Distribution over the Number of Interacting Nucleons in Nucleus-Nucleus Interaction at High Energies.
S. A. Khorozov. 1980, 7p
In Russian.
U.S. Sales Only.

In the approximation of independent interactions a method of calculating the sigmasub(k) cross sections of interaction of k and only k nucleons of A sub 1 nucleus interacting with A sub 2 nucleus is given. It is shown that the calculation results agree with the experimental data on exp 4 He fragmentation on nuclei and with the data on characteristics of multiple pion production in exp 4 He+A-interactions. The formulae and calculation results for cross sections of "central" interactions are presented. (Atomindex citation 11:568220)

JYFL-RR-7/80 PC **A02**/MF **A01**
Jyvaeskylae Univ. (Finland). Dept. of Physics.
Electromagnetic Decay of the 0 sub 2+ State in the Doubly Closed Shell Nucleus exp 14664 Gd sub 82.
R. Julin, J. Kantele, M. Luontama, A. Passoja, and P. Kleinheinz. May 80, 11p
U.S. Sales Only.

The existence of the 0 sub 2+ state in exp 146 Gd at 2165.0(4) keV is established through observation of the E0(0 sub 2+ implies 0 sub 1+) transition. The measured half-life 375(40) ps of this state corresponds to a monopole strength of rho exp 2 = 0.0122(13) which is taken as evidence against a strong state dependence of the effective proton monopole charge. (Atomindex citation 11:564205)

KFK-2995 PC **A06**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Kernphysik.
Recent E exp + E exp - Physics. Lectures.
G. Fluegge. Jul 80, 117p CONF-8003123-1
International winter meeting on fundamental physics, Ronda, Spain, 24 Mar 1980.
U.S. Sales Only.

Recent results from e exp + e exp - storage rings are discussed, with emphasis on PETRA experiments: total cross section and search for toponium; check of QED in e, mu and tau pair production; jet physics and evidence for gluon bremsstrahlung. (Atomindex citation 11:561264)

KFK-2996-B PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Kernphysik.
Phenomenological Interpretation of the Production Cross Section for the Reaction p + p Implies pi + D.
C. Weddigen. Jul 80, 14p
U.S. Sales Only.

Using new data on the unpolarized differential cross section for the reaction pp implies pi d, obtained by the NESIKA collaboration at SIN, the energy dependence of the anisotropy parameters gamma sub 0 , gamma sub 2 , and gamma sub 4 is interpreted phenomenologically. Especially the energy dependence of gamma sub 4 , which is stronger than predicted theoretically, could be understood as being due to the behaviour of a production amplitude with lsub(pi) = 3 near threshold. Technical details are given in Appendix A,B, and C. (Atomindex citation 11:567752)

KFKI-1980-42 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Propositional Systems in Local Field Theories.
M. Banai. Jul 80, 20p
U.S. Sales Only.

The authors investigate propositional systems for local field theories, which reflect intrinsically the uncertainties of measurements made on the physical system, and satisfy the isotony and local commutativity postulates of Haag and Kastler. The spacetime covariance can be implemented in natural way in these propositional systems. New techniques are introduced to obtain these propositional systems: the lattice-valued logics. The decomposition of the complete orthomodular lattice-valued logics shows that these logics are more general than the usual two-valued ones and that in these logics there is enough structure to characterize the classical and quantum, non relativistic and relativistic local field theories in a natural way. The Hilbert modules give the natural inner product "spaces" (modules) for the realization of the lattice-valued logics. (Atomindex citation 11:560313)

KFKI-1980-52 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
N-Body Methods in the Theory of Nuclear Reactions.
G. Bencze. Aug 80, 7p
U.S. Sales Only.

The traditional method of applying two-body methods for the study of nuclear reactions is briefly reviewed. The recent developments in the N particle scattering theory are described in detail. The application of the methods in the study of effective two and few-body problems is also considered. (Atomindex citation 11:568234)

KFKI-1980-55 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Null Killing Vectors.
B. Lukacs, Z. Perjes, and A. Sebestyen. Aug 80, 18p
U.S. Sales Only.

Space-times admitting a null Killing vector are studied, using the Newman-Penrose spin coefficient formalism. The properties of the eigenrays (principal null curves of the Killing bivector) are shown to be related to the twist of the null Killing vector. Among the electrovacs, the ones containing a null Maxwell field turn out to belong to the twistfree class. An electrovac solution is obtained for which the null Killing vector is twisting and has geodesic and shearfree eigenrays. This solution is parameterless and appears to be the field of a zero-mass, spinning and charged source. (Atomindex citation 11:566458)

KFTI-80-2 PC **A03**/MF **A01**
Akademiya Nauk URSR, Kharkov. Fiziko-Tekhnicheskii Inst.
Manifestation of Neutral Weak Currents in the E exp + E exp - Annihilation.
M. P. Rekalo, G. I. Gakh, and A. P. Korzh. 1980, 34p
U.S. Sales Only.

The polarization effects, caused by the interference between electromagnetic and neutral weak currents mechanisms, are investigated for the inclusive V-meson production in the e exp + e exp - - annihilation. The polarization states of the V-meson are discussed in detail. We use three decriptions of the V-meson polarization. They are: the 4-vector of spin and quadrupole tensor description, the polarization vector description and the density matrix, formalis. The collision of the polarized beams is characterized by the virtual photon and Z-boson density matrix in the helicity representation. (Atomindex citation 12:603753)

KFTI-80-30 PC **A05**/MF **A01**
Akademiya Nauk URSR, Kharkov. Fiziko-Tekhnicheskii Inst.
General and Nuclear Physics.
1980, 92p
U.S. Sales Only.

Separate abstracts are presented for each of the conference papers included in the data base. (ERA citation 07:005985)

KIYI-79-10 PC **A03**/MF **A01**
Akademiya Nauk URSR, Kiev. Inst. Yadernykh Issledovanii.
Mechanism of the Compound-Nucleus Formation at Low and Intermediate Neutron Energies.
M. B. Fedorov. 1979, 31p
In Russian.
U.S. Sales Only.

The properties of optical-model absorptive potential at low and intermediate energies of neutrons in neutron reactions are analyzed. It is shown that the account of the specific structure of channel coupling leads in general to dependence of the generalized optical-model potential (GOM) on reaction channel. Two-channel GOM potential introduction with the preferable absorption in one-photon channels for spherical nuclei is based on account of specific coupling of vibrational channels. The calculations are compared with experimental data at low energies. The results of this comparison show that for mass number A=4THETA-140 the considered approach give good agreement with experiments. (Atomindex citation 11:568244)

LAPP-TH-01 PC **A03**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
Final States in E exp + E exp - Annihilation.
M. K. Gaillard. Sep 79, 37p
Seminar on probing hadrons with leptons, Erice, Italy, 13 - 21 Mar 1979.
U.S. Sales Only.

Energy flow analysis is described with emphasis on tests of perturbative QCD and probes of new flavors. non-perturbative effects and some aspects of weak interactions are briefly discussed. (Atomindex citation 11:561138)

LAPP-TH-02 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
Jets in Leptoproduction from QCD.
P. Binetruy, and G. Girardi. Sep 79, 20p
Seminar on probing hadrons with leptons, Erice, Italy, 13 - 21 Mar 1979.
U.S. Sales Only.

We review some of the variables used in studying jets in leptoproduction: Sterman-Weinberg distributions, thrust, spherocity, pointing vectors and angular asymmetries. (Atomindex citation 11:561139)

LAPP-TH-14 PC **A03**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
Uncertainties in the Proton Lifetime.
J. Ellis, D. V. Nanopoulos, S. Rudaz, and M. K. Gaillard. Apr 80, 41p
U.S. Sales Only.

We discuss the masses of the leptoquark bosons m(x) and the proton lifetime in Grand Unified Theories based principally on SU(5). It is emphasized that estimates of m(x) based on the QCD coupling and the fine structure constant are probably more reliable than those using the experimental value of sin exp 2 theta(w). Uncertainties in the QCD lambda parameter and the correct value of alpha are discussed. We estimate higher order effects on the evolution of coupling constants in a momentum space renormalization scheme. It is shown that increasing the number of generations of fermions beyond the minimal three increases m(X) by almost a factor of 2 per generation. Additional uncertainties exist for each generation of technifermions that may exist. We discuss and discount the possibility that proton decay could be 'Cabibbo-rotated' away, and a speculation that Lorentz invariance may be violated in proton decay at a detectable level. We estimate that in the absence of any substantial new physics beyond that in the minimal SU(5) model the proton lifetimes is 8 x 10 exp 30+-2 years. (Atomindex citation 12:576803)

LAPP-TH-17 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
General Classical Solutions in the CPsup(N-1) Model.
A. M. Din, and W. J. Zakrzewski. Apr 80, 13p
U.S. Sales Only.

We study the classical solutions with finite action of the CPsup(n-1) non-linear sigma model in two dimensions. The general solution can be expressed explicitly in terms of n rational analytic functions. All solutions which are neither instantons nor anti-instantons turn out to be saddle points of the action. (Atomindex citation 12:576804)

LAPP-TH-18 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
What is Happening to Multiquark Baryons.
H. Hogaasen, and P. Sorba. May 80, 6p
U.S. Sales Only.

We compare the theoretical expectations and experimental observations that should have relevance for multiquark baryons. Agreement between theory and experiments sometimes seems good and we discuss some urgent questions that experimenters might be able to answer soon. (Atomindex citation 12:576805)

LAPP-TH-20 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
Some Relevant Properties of SO(N) Representations for Grand Unified Theories.
G. Girardi, P. Sorba, and A. Sciarrino. May 80, 25p
U.S. Sales Only.

General properties of the SO(n) groups are examined, with emphasis on the usefulness of the Gel'fand-Zetlin basis for explicit calculations. The SO(n) representations containing a vector stabilized by subgroups of the type S(O(n-p) x O(p)), SU(k) x U(1) or SU(k) if n=2k, are characterized in view of selecting Higgs representations in SO(n) gauge models. Some useful properties of the SU(n) Gel'fand-Zetlin basis are given in the appendices. (Atomindex citation 12:576806)

LAPP-TH-21 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
Properties of General Classical CPsup(N-1) Solutions.
A. M. Din, and W. J. Zakrzewski. May 80, 7p
U.S. Sales Only.

The general classical solutions with finite action of the CPsup(n-1) model are displayed. Various properties of the solutions such as topological charge, action, Baecklund like transformations and stability are discussed. (Atomindex citation 12:576807)

LAPP-80-04 PC **A02**/MF **A01**
Grenoble-1 Univ., Annecy (France). Lab. de Physique des Particules.
2 gamma Process in High Energy EP Collisions.
G. Coignet. Apr 80, 1p CONF-800499-3(Sum.)
International workshop on gamma-gamma collisions, Amiens, France, 8 Apr 1980.
U.S. Sales Only.

No abstract available.

LPC-80-03 PC **A03**/MF **A01**
College de France, Paris. Lab. de Physique Corpusculaire.
Large Non Perturbative Effects for Small Xsub(E) in Lepton-Proton Scattering.
C. Chahine. 1980, 50p
U.S. Sales Only.

A rigorous non perturbative approach to radiative corrections in charged lepton scattering is derived from a rearrangement of Q E D perturbation series. The new series is covariant and involves no cut-off. Succesive terms, corresponding to an increasing number of 'oblique' photons, incorporates the emission of an arbi-

trary number of collinear photons. The infrared spectrum of an oblique photon is shown to be suppressed. The zero and one oblique photon terms are computed and numerical results for the elastic contribution are presented. In the very inelastic regime, small xsub(E) and large Qsub(E)sup(2), we found an elastic contribution to the cross-section quite larger than that predicted by standard perturbation theory. We note that our results may modify somewhat the current picture of scaling violations, at least in the very inelastic regime. (Atomindex citation 11:561141)

LYCEN-7975 PC **A02**/MF **A01**
Lyon-1 Univ., Villeurbanne (France). Inst. de Physique Nucleaire.
Critical Opalescence of the Pion Field and the M1 Form Factor of exp 12 C: an Investigation of the Role of the rho Meson.
J. Delorme, A. Figureau, and A. Giraud. Nov 79, 10p
U.S. Sales Only.

It is shown that the inelastic M1 form factor of exp 12 C can be interpreted by nuclear polarization phenomena with inclusion of the rho meson in the polarizing interaction playing an essential role at large momenta. Whereas much of the observed anomaly can be attributed to standard core polarization effects, a large opalescence of the pion field (a factor 4.5 enhancement) would be needed to get full agreement with experiment. (Atomindex citation 11:561374)

LYCEN-8037 PC **A02**/MF **A01**
Lyon-1 Univ., Villeurbanne (France). Inst. de Physique Nucleaire.
Energy Dissipation and Nucleon Exchange in exp 40 Ar+ exp 27 Al and exp 14 N+ exp 27 Al Heavy Ion Reactions.
R. Billerey, C. Cerruti, A. Chevarier, N. Chevarier, and B. Cheynis. May 80, 17p
U.S. Sales Only.

Extensive analysis of the energy dissipation and nucleon exchange has been done with heavier systems. Here we choose the two light systems exp 40 Ar+ exp 27 Al (E(lab)=340 MeV) and exp 14 N+ exp 27 Al (E(lab)=100 MeV) in order to study the correlation of the energy dissipation with the variance of the charge distributions as a function of total kinetic energy loss bins. Considerable energy damping is found to occur in the approach phase which cannot be explained by a simple Fokker-Planck diffusion model. Indeed a model which interprets the collision as a local equilibration followed by diffusive phenomena is more appropriate to fit the data. The characteristic time could be attributed to the giant dipole resonance. (Atomindex citation 11:564213)

MPI-PAE/Exp.El.-82 PC **A05**/MF **A01**
Max-Planck-Inst. fuer Physik und Astrophysik, Munich (Germany, F.R.).
Investigation of the Semi-Leptonic Decay of the F-Meson.
Diss. (D.Sc.),
C. Gagern. Jan 80, 81p
In German.
U.S. Sales Only.

Data in the center of mass energy range of 4-5 GeV have been analyzed at the double arm spectrometer DASP of the e exp + e exp - storage ring DORIS (DESY Hamburg). Pairwise F anti F-creation is possible from 4.06 GeV because the mass of the F-meson is at 2.03 GeV/c exp 2 . The decay F implies etaX implies gamma gamma X was used for detection. One gets the detection probabilities of the apparatus and also the inclusive eta-cross section from model computations that are based on the statistical Iso-spin model. At the some time the same model calculations for D-mesons show that the observed eta-signal cannot be created by D-mesons decays. The measurement of the semileptonic decay F anti F implies eta e nu sub(e)X yields the semi-leptonic branching ratio BRsub(F implies eX), in which the number of eta-mesons in events with detected electrons is related to the number of eta-mesons in all the events. This measurement is independent of the determination of the charm cross-section. (Atomindex citation 11:561265)

NIIAR-28(436) PC **A02**/MF **A01**
Nauchno-Issledovatel'skii Inst. Atomnykh Reaktorov, Dimitrovgrad (USSR).
Exp 249 Bk Half-Life Determination.
V. G. Polyukhov, G. A. Timofeev, and B. I. Levakov. 1980, 11p
In Russian.
U.S. Sales Only.

The results of exp 249 Bk half-life determination are presented. The techniques of identification and control of exp 249 Bk radiochemical purity and methods of mathematical treatment of measurement results have been described. exp 249 Bk half-life calculated from long observed activity data for 30 radiometrical preparations is 329+-4 days. (Atomindex citation 12:604251)

OUP-81-09 PC **A05**/MF **A01**
Oslo Univ. (Norway). Fysisk Inst.
Nuclear Physics Group Report - January 1 to December 31, 1980.
1980, 89p
U.S. Sales Only.

Separate abstracts are presented for each of the conference papers included in the data base. (ERA citation 07:005986)

REU-ITP-394 PC **A02**/MF **A01**
Eotvos Lorand Univ., Budapest (Hungary). Elmeleti Fizikai Intezet.
Towards Complete Integrability in Four Dimensions.
P. Forgacs, Z. Horvath, and L. Palla. May 80, 14p
U.S. Sales Only.

A geometrical interpretation of self-duality equations is given. In the case of SU(2) the existence of an infinite parameter invariance group of these equations is pointed out. An inverse scattering problem is derived and some applications are presented. (Atomindex citation 11:560328)

REU-ITP-396 PC **A02**/MF **A01**
Eotvos Lorand Univ., Budapest (Hungary). Elmeleti Fizikai Intezet.
Static, Axially Symmetric Solutions of SU(2) Monopoles.
Z. Horvath, and T. Kiss-Toth. Jun 80, 14p
U.S. Sales Only.

The equations for the most general axially symmetric ansatz are derived for SU(2) monopoles in the Bogomol'ny-Prasad-Sommerfield limit. The symmetries of these equations are described. The existence of an infinite parameter invariance group is pointed out. (Atomindex citation 11:560329)

RL-80-022 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
QCD Contributions to Vacuum Polarization.
L. J. Reinders, H. R. Rubinstein, and S. Yazaki. May 80, 14p
U.S. Sales Only.

The perturbative and non-perturbative contributions to the vacuum polarization have been computed to lowest non trivial order from all currents up to and including spin 2 exp + + . These expressions are important, for example, to evaluate QCD sum rules for heavy and light quark systems as shown by Shifman, Vainshtein and Zakharov (Nucl. Phys.: B 147; 385, 448, 519 (1979)). Most of the known ones are verified, one slightly changed, and many new ones are displayed. (Atomindex citation 11:567772)

RL-80-031 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Masses of Lowest Lying Heavy Mesons in QCD.
L. J. Reinders, H. R. Rubinstein, and S. Yazaki. Jun 80, 8p
U.S. Sales Only.

Using QCD sum rules for a polarization operator which is induced by all possible currents with Jsup(PC)= O exp -- , 1 exp -- , 0 exp + + , 1 exp + + and 2 exp + + the S- and P-states of charmonium are calculated. Power corrections due to the gluon condensate operator Gsub(mu upsilon)sup(a) Gsub(mu upsilon)sup(a) are included and shown to be very important. All known lowest lying charmonium states are reproduced extremely well and a firm prediction is made for the exp 1 P sub 1 state. (Atomindex citation 11:561142)

RL-80-039 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Polarization in K exp + N Charge Exchange Scattering Between 0.851 GeV/C and 1.351 GeV/C.
S. J. Watts, D. V. Bugg, and A. A. Carter. Jul 80, 13p
U.S. Sales Only.

The polarization parameter for K exp + n charge exchange scattering has been measured at five momenta between 0.851 GeV/c and 1.351 GeV/c for centre of mass angles -0.8 <cos theta* <0.8. Results from a phase shift resonances are observed. (Atomindex citation 12:576896)

RL-80-045 PC **A04**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
S = -1 Baryons - an Experimental Review.
G. P. Gopal. Jul 80, 66p
U.S. Sales Only.

This review sets out to compile a spectrum of the more probable strangeness -1 Baryons from the claims of the different partial wave analyses and the total cross-section and production experiments. For this purpose recently published and preliminary unpublished data in KN induced channels is reviewed and compared with predictions of various partial wave amplitudes. Results from a new partial wave analysis of the KN channel covering the range 1470 to 2170 MeV in the c.m. are presented. The spectrum of Ysup(*)s and the values for their decay amplitudes are compared with the QCD based quark model of Isgur and Karl. New experiments are suggested to help determine the KN, pi LAMDA and pi sigma partial wave amplitudes with greater certainty. (Atomindex citation 12:576809)

RL-80-046 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Average Charged Particle Multiplicities in Pp, pi p and E exp + E exp - Interactions.
A. K. Nandi. Jul 80, 9p
U.S. Sales Only.

The average charged particle multiplicities in pp and pi p interactions, <nsub(ch)(s)>sub(pp) and <nsub(ch)(s)>sub(pi p) respectively, are analysed in terms of the average charged particle multiplicity in quark-quark interactions, <nsub(ch)(ssub(qq))>. Also the average charged particle multiplicity in e exp + e exp - interactions is compared with <nsub(ch)(ssub(qq))> at ssub(qq)=ssub(e exp + e exp -)sub. (Atomindex citation 12:576897)

RL-80-095 PC **A03**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Hadron Spectroscopy: A Suasivious Case for QCD.
F. E. Close. Oct 80, 26p CONF-8010239-1
Kupari summer school, Kupari, Yugoslavia, Oct 1980.
U.S. Sales Only.

Having considered the role of coloured gluons in hadron spectroscopy, some features of the Fermi Breit interaction resulting from one gluon exchange are compared with prominent features in spectroscopy. It is shown that some of these features do tend to point clearly towards the presence of such vector interaction and hence are supportive of QCD. (Atomindex citation 12:603755)

RL-80-099 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Picture of QCD Jets: Leading LOG Approximation and Beyond It.
J. Kalinowski, and K. Konishi. Dec 80, 25p CONF-8009214-1
International summer institute on theoretical physics: current topics in elementary particle physics, Bad Honnef, F.R. Germany, 1 Sep 1980.
U.S. Sales Only.

The picture of QCD jets as it emerged from the analyses based on perturbative QCD in the leading log approximation (LLA) and beyond it is reviewed. In part I the intuitive (fractal) picture and quantitative description of QCD jets in LLA are considered and some salient aspects of QCD corrections beyond the leading order are discussed. In part II the construction of the jet calculus beyond the leading order, and calculations to next-to-leading order of jet calculus vertices and generalized Altarelli-Parisi parton decay functions are summarized. Explicit calculation suggests important corrections beyond leading order to the previous anal-

yses of quantities which are sensitive to the multiplicity of soft gluons. On the other hand, for the measures which depend on the effects of soft gluons only indirectly (e.g. through the observation of fast quarks), the explicit results to next-to-leading order are consistent with the general arguments given by several authors. Corrections to inclusive Psub(T)-correlations among fast particles inside a jet, are found to be small beyond LLA. (Atomindex citation 12:603756)

RRC-42 PC **A03**/MF **A01**
Reactor Research Centre, Kalpakkam (India).
Evaluation of Statistical Resonance Parameters for exp 232 Th in 4 to 41 KeV Energy Region.
S. Ganesan. 1980, 28p
U.S. Sales Only.

An exhaustive compilation of mean resonance parameters for exp 232 Th isotope reported by different experimental groups, evaluators and users is presented. A set of mean resonance parameters is obtained for exp 232 Th for use in reactor calculations by adjusting the p wave strength function as a function of energy region for a broad group structure corresponding to the already evaluated total and partial cross sections recommended in the ENDF/B-IV library in 4 to 41 keV energy region. The difficulties associated with the evaluation of mean resonance parameters for given evaluated cross sections in the unresolved resonance region are highlighted. A brief comparison of the American ENDF/B procedure and the German KEDAK procedure for the processing of the unresolved resonance data is also given. A possibility exists to explain part of the discrepancies between the calculated and the experimentally determined integral parameters to be due to the non-uniqueness of the mean resonance parameters in the unresolved resonance region for the main fissile and fertile nuclides. It appears more satisfying to evaluate the mean resonance data for a given multigroup structure used in readtor calculations unlike the ENDF/B convention. It is further recommended that the thick sample transmission and self-indication measurements be performed for /sup 232/Th in order to determineexperimentally the self-shielded cross sections in the unresolved resonance region and to support the above mentioned evaluation of mean resonance parameters. (Atomindex citation 12:603985)

RRK-79-15 PC **A02**/MF **A01**
Hiroshima Univ., Takehara (Japan). Research Inst. for Theoretical Physics.
Covariant Approach to the Generalization of the Goldstone Theorem.
M. Shintani. Oct 79, 19p
U.S. Sales Only.

By adding the constraint eq. (P sub(mu), G) exp + 0 > = 0 on the generator G to the conventional Goldstone theorem, we present an approach to the generalized Goldstone theorem which applies when the conserved current involves non-trivial c-number functions. As a result of the constraint eq. (1.2), we derive a new key equation. By solving a new key equation together with the other key equations already obtained in ref. (1), we extract only the Goldstone modes. It is shown that any generator is either a relevant generator or an irrelevant one. (Atomindex citation 11:560330)

RRK-79-17 PC **A03**/MF **A01**
Hiroshima Univ., Takehara (Japan). Research Inst. for Theoretical Physics.
Effective Hamiltonian for delta C = 1 Nonleptonic Interactions in the Kobayashi Maskawa Model.
T. Hayashi, T. Karino, K. Ohya, and T. Oka. Nov 79, 34p
U.S. Sales Only.

The effective nonleptonic weak interaction Hamiltonian for the exp + delta C exp + = 1 processes is calculated by using the quantum chromodynamics with the color octet massless gluons and the renormalization group equations, in the Kobayashi-Maskawa model. The "penguin" diagram contributes to the effective Hamiltonian by the devision of the range of virtual momenta integration. The U-spin operators are taken as the operator bases. The matrix elements of D implies K pi , pi pi , KK decays are calculated and compared with the recent experimental data. There is a possibility of our results showing the consistency with the data. (Atomindex citation 11:561143)

UM-P-78/52 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Photoneutron Cross Section of exp 54 Fe.
J. W. Norbury, M. N. Thompson, K. Shoda, and H. Tsubota. 1979, 13p
U.S. Sales Only.

A high resolution measurement of the exp 54 Fe(gamma ,n) cross section is reported. This and a previously measured exp 54 Fe (gamma ,p) cross section are discussed in terms of the isospin splitting of the E1 giant dipole. (Atomindex citation 12:603986)

UM-P-78/54 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Two General Classes of Self Dual, Minkowski Propagating Wave Solutions in Yang Mills Gauge Theory.
E. Kovacs, and S. Y. Lo. 1979, 6p
U.S. Sales Only.

Two classes of self dual propogating wave solutions to the sourceless field equations in Minkowski space are presented. Some of these solutions can be linearly superposed. These waves can propogate at either the speed of light or at a speed less than that of light. (Atomindex citation 12:602800)

UM-P-78/61 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Electron Scattering from A=3 Nuclei.
R. A. Brandenburg. 1979, 16p
U.S. Sales Only.

Explicit formulae are given for calculating, with momentum-space wave functions, the cross section for electrons scattered from the nuclei exp 3 He and exp 3 H. (Atomindex citation 12:603757)

UM-P-78/63 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Static Quark Potential 2.
F. Melia, and S. Y. Lo. 1979, 22p
U.S. Sales Only.

A static quark potential displaying many of the features inherent in phenomenological treatments of Q-antiQ bound states is found to be a solution of the Yang-Mills equations in the classical limit. Although the potential provides a confinement-like trap, going like Coulomb plus linear at small r and like 1n(r) at larger distance, it levels off to a constant at r implies infinity, and hence does not provide permanent confinement. (Atomindex citation 12:603758)

UM-P-78/66 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Scaling and Prescaling in Quarkonium.
R. C. Warner, and G. C. Joshi. 1979, 45p
U.S. Sales Only.

Recent experiments in the upsilon region indicate the quark mass dependence of quark-antiquark bound state properties. Classes of quark-antiquark potentials exhibiting scaling of energy level spacing with quark mass are presented, and the importance of mass dependence of bound state properties in investigating the nature of the potential is emphasised. The scaling potentials considered are V=V(msup(1/2)r), which exhibits constant level spacing, and V=bmsup(alpha)rsup(beta), and its generalizations, which has scaling of energy levels controlled by the exponents alpha and beta . The class of potentials yielding constant level spacing is shown to be consistent with the interpretation of the state recently observed at 9.46 GeV in e exp + e exp - annihilations as a bound state of a new quark and antiquark with esub(p)=1/3. (Atomindex citation 12:603759)

UM-P-78/69 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Exp 14 N + exp 10 B Fusion and Elastic Scattering Cross Section Measurements Near the Interaction Barrier.
S. C. Wu, J. C. Overley, C. A. Barnes, and Z. E. Switkowski. 1979, 44p
U.S. Sales Only.

The exp 14 N + exp 10 B fusion reactions were studied at c.m. energies between 2.9 and 7.5 MeV by measuring the yields of gamma -rays from the residual nuclei formed by particle evaporation from the compound system. Cross sections for formation of the evaporation residues exp 16 O, exp 19 F, exp 19 Ne, exp 20 Ne, exp 21 Ne, exp 22 Ne, exp 22 Na, exp 23 Na and exp 23 Mg, as well as the total cross section, were deduced from these yields with the aid of statistical model calculations. exp 14 N + exp 10 B elastic scattering differential cross sections were measured from 4.3 to 9.1 MeV at THETA 74.4 degrees, and from 3.3 to 8.3 MeV at THETA = 90.0 degrees. The elastic scattering cross sections were analyzed within the framework of the incoming-wave boundary condition (IWBC) model. The fusion cross sections calculated for the real ion-ion potential deduced from the IWBC model fit to the elastic scattering are in good agreement with the measured values. (Atomindex citation 12:603988)

UM-P-78/72 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Cross Section Measurement for exp 45 Sc(P, gamma) exp 46 Ti.
S. D. Solomon, and D. G. Sargood. 1979, 16p
U.S. Sales Only.

The cross section of the reaction exp 45 Sc(p, gamma) exp 46 Ti has been measured over the bombarding energy range 0.7 - 4.2 MeV. This energy range is appropriate for calculating the interaction rate in a stellar interior over the temperature range 10 exp 9 - 10 exp 10 K. The results are compared with predictions of the statistical model of nuclear reactions. Stellar interaction rates are calculated. (Atomindex citation 12:603989)

UM-P-78/73 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
4 exp - Particle-Hole States in exp 16 O.
R. S. Henderson, B. M. Spicer, I. D. Svalbe, V. C. Officer, and G. G. Shute. 1979, 7p
U.S. Sales Only.

4 exp - states of exp 16 O, at excitation energies of 17.79 and 19.80 MeV (T=O) and 18.98 MeV (T=1) are observed to be strongly excited in inelastic scattering of 135 MeV protons at momentum transfers of 200-550 MeV/c. The present ambiguity in the spin and parity assignments for the 17.79 MeV state is removed. (Atomindex citation 12:603990)

UM-P-78/74 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Quantum Electrodynamics at Short Distances and the Stability of the Vacuum.
B. H. Kellett. 1979, 9p
U.S. Sales Only.

It is shown that the invariant charge of quantum electrodynamics cannot change sign as a function of q exp 2 . Asymptotically, the invariant charge is given by a non-linear equation that has no real and negative solutions. Contrary to the indications from low order perturbation theory, therefore, the invariant charge is everywhere non-negative, and the vacuum does not become unstable. (Atomindex citation 12:602803)

UM-P-78/76 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Microscopic Weak-Coupling Model of Nuclear Structure.
I. Morrison, and K. Amos. 1979, 11p
U.S. Sales Only.

Methods of approximation are described by which standard microscopic (shell) model calculations can be used to analyze the low excitation spectroscopy of heavy nuclei. The utility of the weak-coupling scheme improves as the neutron excess of the nucleus under study ensures that the active protons and neutrons occupy inequivalent shells. Application of these methods in the unfavourable (in terms of neutron excess) case of exp 58 Ni is made to demonstrate a use of those methods even with the relatively light p-f shell nuclei. (Atomindex citation 12:603912)

UM-P-78/78 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.

Nucleon-Nucleon Potential.
L. Petris. 1981, 15p
U.S. Sales Only.

A potential is presented which is consistent with the nucleon-nucleon (NN) elastic scattering data up to Esub(LAB)=400 MeV and L=5, and the deuteron properties. (Atomindex citation 12:603913)

UM-P-78/81 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Comparison of Spectroscopic Models of Low Excitation 2 exp + States in exp 24 Mg and exp 28 Si Using Inelastic Proton Scattering.
K. Amos, I. Morrison, and P. Nesci. 1979, 19p
U.S. Sales Only.

Distorted Wave approximation analyses of the inelastic scattering of 49.5 MeV protons from exp 24 Mg and exp 28 Si are used to compare 2 exp + transition densities that were obtained from a standard shell model, deformed potential models and an SU(3) model of the low excitation spectroscopy of these nuclei. Analyzing power predictions do not reproduce the data adequately; the discrepancies indicating a deficiency in the transition mechanism prescription. (Atomindex citation 12:603991)

UM-P-78/85 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Resonance Strength of the 1175 KeV Resonance in exp 6 Li(Alpha , gamma) exp 10 B.
R. H. Spear, Z. E. Switkowski, D. L. Kennedy, and J. C. P. Heggie. 1979, 17p
U.S. Sales Only.

The resonance strength of the 1175-keV resonance in exp 6 Li(alpha , gamma) exp 10 B has been remeasured using a Ge(Li) detector. The result obtained is 0.40+-0.06 eV. This is in good agreement with previous measurements using NaI(T1) detectors, provided that the earlier results are multiplied by the factor 6/10 to convert them to the centre-of-mass system. Some of the consequences which arise from the failure of previous workers to make this correction before evaluating the significance of their results are discussed. (Atomindex citation 12:603992)

UM-P-78/86 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Yield Measurements in the Reactions exp 48 Ca(P, gamma) exp 49 Sc and exp 48 Ca(P,N) exp 48 Sc.
S. R. Kennett, Z. E. Switkowski, B. M. Paine, and D. G. Sargood. 1979, 16p
U.S. Sales Only.

Absolute cross sections for the reactions exp 48 Ca(p, gamma) exp 49 Sc and exp 48 Ca(p,n) exp 48 Sc have been measured for proton bombarding energies from 0.76 MeV to 2.20 MeV. The results are in satisfactory agreement with predictions of the Hauser-Feshback statistical model of nuc ear reactions. In particular, the predicted flattening out of the (p, gamma) cross section above the threshold for the (p,n sub 3) channel is consistent with the data. (Atomindex citation 12:603993)

UM-P-78/88 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Higher-Order Tensor Orientations of Recoil Nuclei in Muon Capture.
P. R. Subramanian, and V. Devanathan. 1979, 16p
U.S. Sales Only.

For the experimental set-up of the Louvain-Saclay collaboration, general expressions are derived for all possible even- and odd-order tensor orientations of recoil nuclei, recoiling into the forward (or backward) hemisphere in the reaction mu exp - + A(Jsub(i)=0) implies B(Jsub(f)>=1)+ nu sub(mu). It is shown that the odd-order tensor orientations are proportional to the longitudinal polarization and the even-order tensor orientations are proportional to a linear combination of longitudinal and average polarizations of the recoil nucleus. These results are independent of nuclear structure and the dynamics of the muon-capture interaction. Numerical results are presented for the case of muon capture by exp 16 O. (Atomindex citation 12:603914)

UM-P-78/89 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Analyses of Inelastic Proton and Electron Scattering to the 2 exp + (4.43 MeV) State in exp 12 C.
K. Amos, and I. Morrison. 1979, 20p
U.S. Sales Only.

Analyses of data from the inelastic scattering of 65-MeV protons and of 135-MeV electrons are used to test large-basis (projected Hartree-Fock) model spectroscopies for the ground to 2 sub 1+ (4.43 MeV) transition in exp 12 C. From distorted wave approximation calculations of the proton scattering, reasonably good agreement with the empirical cross section was obtained but no spectroscopy yields the distinctive structure of the recently measured analyzing power data. In like fashion, the longitudinal form factor ascertained from the electron-scattering data is well produced by calculations based upon the same PHF models of spectroscopy. The predictions of the transverse form factor, however, are quite distinctive and only in one case, that involving a strong spin-orbit effect in the basis, is the data reproduced. (Atomindex citation 12:603915)

UM-P-78/90 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Exp 12 C(p,2P) exp 11 B Reaction at 100MeV.
D. W. Devins, D. L. Friesel, W. P. Jones, A. C. Attard, and I. D. Svalbe. 1979, 24p
U.S. Sales Only.

The exp 12 C(p,2p) exp 11 B reaction has been measured at 100 MeV in both symmetric and asymmetric geometries. Distorted Wave Impulse Approximation calculations were used to obtain spectroscopic factors for all states of exp 11 B below 7 MeV excitation. From the spectroscopic factors and the shapes of the measured angular correlations, it is concluded that (1) no large 1f-components are present in the wavefunction of the ground state of exp 12 C, and (2) this experiment gives no evidence for the formation of giant resonances as the intermediate step in multi-step reaction processes to the 4.44 MeV (5/2 exp -) and 6.74 MeV (7/2 exp -) states of exp 11 B. (Atomindex citation 12:603994)

UM-P-78/91 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Application of Potential.
L. Petris. 1979, 34p
U.S. Sales Only.

This report summarizes the results obtained with the nucleon-nucleon potential presented previously for: 1) the deuteron properties and wave function, 2) a Hartree-Fock calculation on O exp 16 , and 3) the perturbation V-matrix and G-matrix results for the potential in relation to the results of other potentials and to saturation. (Atomindex citation 12:603916)

UM-P-78/93 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Partial Wave Analysis of the exp 18 O(p, alpha sub 0) exp 15 N Reaction.
L. W. J. Wild, and B. M. Spicer. 1979, 11p
U.S. Sales Only.

A partial wave analysis of the differential cross sections for the exp 18 O(p, alpha sub 0) exp 15 N reaction has been carried out applying the formalism of Blatt and Biedenharn (1952), made specific for this reaction. The differential cross sections, measured at 200 keV intervals from 6.6 to 10.4 MeV bombarding energy, were subjected to least-squares fitting to this specific analytic expression. Two resonances were given by the analysis, the exp 19 F states being at 14.71+-0.07 MeV (1/2 exp -) and 14.80 + 0.07 MeV (1/2) exp + . (Atomindex citation 12:603995)

UM-P-78/94 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Test of a Model T-Matrix for Direct Reaction Inelastic Scattering.
M. Fox, I. Morrison, K. Amos, and D. Wiess. 1979, 13p
U.S. Sales Only.

Differential cross sections and analyzing powers from the inelastic scattering of 65-MeV protons leading to the 1 exp + T=0 (12.71 MeV) and 1 exp + T=1 (15.11 MeV) states in exp 12 C have been analysed as tests of a model two-nucleon t-matrix. (Atomindex citation 12:603917)

UM-P-78/98 PC **A09**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Exp 56 Fe(Alpha , gamma) exp 60 Ni Reaction Cross Section.
M. R. Anderson, S. R. Kennett, Z. E. Switkowski, and D. G. Sargood. 1979, 176p
U.S. Sales Only.

The yield of 1.332 MeV gamma -rays from the reaction exp 56 Fe (alpha , gamma) exp 60 Ni has been measured as a function of alpha -particle bombarding energy in the range 4.2 - 7.1 MeV. This energy region includes the (alpha ,n) threshold at Esub(alpha) = 5.46 MeV. The energy dependence of this gamma -ray cross section, as well as the (alpha , n gamma) cross section is compared with statistical model calculations. Good agreement is achieved between these data and calculations using global optical model parameters to determine the transmission functions. In particular, the pronounced threshold effect in the (alpha , gamma) yield, at the opening of the (alpha , n) channel, is well represented. (Atomindex citation 12:603996)

UM-P-80/29 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Cross Section Measurements and Thermonuclear Reaction Rates.
S. R. Kennett, M. R. Anderson, L. W. Mitchell, Z. E. Switkowski, and D. G. Sargood. 1980, 21p
U.S. Sales Only.

The yields of gamma rays from the reactions exp 50 Ti(p, gamma) exp 51 V and exp 50 Ti(p,p' gamma) exp 50 Ti have been measured as a function of bombarding energy over the range 0.73 - 4.39 MeV and the yield of neutrons from the reaction exp 50 Ti(p,n) exp 50 V has been measured from threshold to a bombarding energy of 4.39 MeV. Competition effects were observed in the gamma -ray yields from the (p, gamma) and (p,p' gamma) reactions at the threshold of the (p,n) reaction. The observed yields in all channels were lower by factors of order 3 than those predicted by statistical model calculations based on global optical parameters and the competition observed in the (p, gamma) yield at the opening of the neutron channel was approximately one half that predicted by the statistical model calculations. These failures of the calculations are tentatively attributed to the neutron closed shell nature of exp 50 Ti. Thermonuclear reaction rates for the (p, gamma) and (p,n) reactions are calculated. (Atomindex citation 12:603997)

UM-P-80/30 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Oscillation and Mixing of Massless Electron and Muon Neutrinos.
B. H. J. McKellar. 1980, 6p
U.S. Sales Only.

It is not necessary that the electron neutrino and muon neutrino themselves have mass for oscillations to occur. For N neutrinos, if one is massive, oscillations occur with unique oscillation length determined by the mass of the heavy neutrino, mimicing two neutrino mixing. Any observation of oscillations cannot therefore be regarded as evidence for a finite mass electron neutrino or muon neutrino. (Atomindex citation 12:603760)

UM-P-80/31 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Neutrino Oscillation and Rare Muon Decays in the Presence of a Heavy Neutrino.
B. H. J. McKellar. 1980, 8p
U.S. Sales Only.

Heavy neutrinos have been recognised as providing a possible mechanism for muon number violating processes. Rates for these processes depend on neutrino mixing angles and masses. If the heavy neutrino mass is less than 400 MeV, the author shows that the present limit on muon neutrino - electron neutrino oscillations provides very stringent limits on the contribution of these processes to the rates for muon number violating processes. (Atomindex citation 12:603761)

UM-P-80/34 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.

Phenomenological Nucleon-Nucleon Interaction.
L. Petris. 1980, 19p
U.S. Sales Only.

A phenomenological NN interaction which fits the deuteron properties and the elastic scattering data, is presented. The only parameters are the pion, rho and omega masses and one overall strength. (Atomindex citation 12:603762)

UM-P-80/38 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Oscillations of Massless Neutrinos as a Refractive Phenomenon.
G. I. Opat. 1980, 9p
U.S. Sales Only.

A phenomenology of neutrino oscillations is presented, based on the assumption that massless neutrinos are refracted in ordinary matter by an interaction, important at low energy, which causes transitions between neutrinos of differing kind. The predictions are experimentally distinguishable from those based on the vacuum oscillations of massive neutrinos. (Atomindex citation 12:603763)

UM-P-80/39 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Phenomenological Model for Cabibbo Favoured Charmed Meson Decays into Three Pseudoscalors: Psub(C) Implies PPP.
R. D. C. Miller, and B. H. J. McKellar. 1980, 38p
U.S. Sales Only.

A phenomenological model for Cabibbo favoured charmed meson decays is constructed which alows for non-charmed intermediate scalar and vector meson contributions. In all, twenty five modes permitted by the model are considered. The model depends upon a single free parameter. Quite reasonable consistency with present branching ratio data is obtained and it is found that for a few modes large scalar contributions could be present. Finally the resulting predictions on the twenty five modes are given and also results concerning the ratio UPSILON(D exp 0)/ UPSILON(D exp +) are obtained. (Atomindex citation 12:603764)

UM-P-80/41 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Resonance Strength Measurements and Thermonuclear Reaction Rates for exp 25 Mg(P, gamma) exp 26 Al.
M. R. Anderson, S. R. Kennett, L. W. Mitchell, and D. G. Sargood. 1980, 23p
U.S. Sales Only.

The strengths of resonances in exp 25 Mg(p, gamma) exp 26 Al in the energy range 317-591 keV have been obtained. Resonance strengths at 317, 387, 433, 591 keV have been measured absolutely. The strengths of resonances at 591, 433 keV were also deduced by comparison with the strength of the resonance at 620 keV in exp 30 Si(p, gamma) exp 31 P. Relative measurements of 10 resonances in the range 317-591 keV were made. Thermonuclear reaction rates are calculated for the reaction exp 25 Mg(p, gamma) exp 26 Al leading to both the ground state and isomeric first excited state of exp 26 Al in the temperature range T = 5 x 10 exp 7 -5 x 10 exp 8 K and are compared with rates determined from cross sections obtained from statistical model calculations. (Atomindex citation 12:603998)

UM-P-80/42 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
T- And M- Baryonia from E exp + E exp - Experiments.
R. G. Ellis, G. C. Joshi, and B. H. J. McKellar. 1980, 10p
U.S. Sales Only.

The relative likelihood of observing M- and T- baryonia in e exp + e exp - annihilation experiments is investigated. The peak production cross section for M-baryonia below NN threshold is found to be approximately 10 times greater than the corresponding quantity for T-baryonia. (Atomindex citation 12:603765)

UM-P-80/47 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Massive Neutrinos, the Goldberger - Treiman Relation, and the pi Implies E nu Branching Ratio.
B. H. J. McKellar. 1980, 6p
U.S. Sales Only.

A neutrino of mass greater than 1 MeV provides a simple explanation of the residual Goldberger-Treiman discrepancy. However this reduces the pi implies e nu branching ratio below the classical V-A value, in contradiction with the present experimental observation. (Atomindex citation 12:603766)

UM-P-80/50 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Influence of Mixing of Finite Mass Neutrinos on beta Decay Spectra.
B. H. J. McKellar. 1980, 8p
U.S. Sales Only.

It is shown that neutrino mixing, of the type required for neutrino oscillations, will complicate efforts to determine the electron neutrino mass from beta decay spectra. The shape of the spectra will depend on the masses and mixing angles of all neutrinos which couple to the electron neutrino. (Atomindex citation 12:603767)

UM-P-80/51 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Muon Electron Scattering and Neutral Currents.
R. G. Ellis, and B. H. J. McKellar. 1980, 15p
U.S. Sales Only.

An analysis is made of the utility of muon-electron scattering as a process for detecting parity violations from the interference between the electromagnetic and weak neutral currents. The scattered electron cross section has an asymmetry with respect to the polarization of the incident muon. The kinematics are optimized to maximize this effect therefore giving the mininum number of muons required to achieve a statistically significant asymmetry. With muons of energy 270 GeV this number is approximately 9 x 10 exp 12 . (Atomindex citation 12:603768)

UM-P-80/52 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Excitation of the 9.50 MeV (9/2 exp +) State of exp 13 C in Intermediate Energy Scattering Experiments.
L. Rikus, S. F. Collins, and K. A. Amos. 1980, 18p
U.S. Sales Only.

The differential cross section for the inelastic scattering of 135 MeV protons leading to the 9.5 MeV state in exp 13 C has been measured. Microscopic DWBA analyses corroborate the 9/2 exp + assignment and show that the angular distribution is well described by a pure (or nearly pure) 1psub(3/2) to 1dsub(5/2) neutron transition with a total angular momentum transfer of 4, a description which is consistent with the previously observed large asymmetry in inelastic pi exp + and pi exp - scattering to this state. (Atomindex citation 12:603999)

UM-P-80/53 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Neutrino Oscillations and Anti nu sub(E)-E Scattering.
B. Halls, and B. H. J. McKellar. 1980, 10p
U.S. Sales Only.

Electron antineutrino-electron scattering is modified in the presence of neutrino mixing and neutrino oscillation. In the Weinberg-Salam model the results for reactor antineutrinos are insensitive to the degree of mixing, to the extent that the experiment of Reines, Gurr and Sobel cannot differentiate between no oscillation and complete disappearance of the electron antineutrinos from the beam. (Atomindex citation 12:603769)

UM-P-80/55 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Phase Space Quark Counting Rule.
C. Wei-gin, and S. Lo. 1980, 24p
U.S. Sales Only.

A simple quark counting rule based on phase space consideration suggested before is used to fit all 39 recent experimental data points on inclusive reactions. Parameter free relations are found to agree with experiments. Excellent detail fits are obtained for 11 inclusive reactions. (Atomindex citation 12:603770)

UM-P-80/56 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Velocity Dependence of Enhanced Dynamic Hyperfine Field for Pd Ions Swiftly Recoiling in Magnetized Fe.
A. E. Stuchbery, G. C. Ryan, H. H. Bolotin, and S. H. Sie. 1980, 13p
U.S. Sales Only.

The velocity-dependence of the magnitude of the enchanced dynamic hyperfine magnetic field (EDF) manifest at nuclei of exp 108 Pd ions swiftly recoiling through thin magnetized Fe has been investigated at ion velocities higher than have heretofore been examined for the heavier nuclides (i.e., at initial recoil velocities (v/Zv sub 0)=0.090 and 0.160, v sub 0 =c/137). These results for exp 108 Pd, when taken in conjunction with those of prior similar measurements for exp 106 Pd at lower velocities, and fitted to a velocity dependence for the EDF, give for the Pd isotopes over the extended velocity range 1.74<=(v/v sub 0)<=7.02, p=0.41+-0.15; a result incompatible with previous attributions of a linear velocity dependence for the field. (Atomindex citation 12:604000)

UM-P-80/57 PC **A04**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Lifetimes of Excited States in exp 196 exp 198 Pt; Application of Interacting Bason Approximation Model to Even Pt Isotopes Systematics.
H. H. Bolotin, A. E. Stuchbery, I. Morrison, D. L. Kennedy, and C. G. Ryan. 1981, 59p
U.S. Sales Only.

The lifetimes and lifetime limits of the low-lying excited states up to and including the 6 sub 1+ levels in exp 196 exp 198 Pt were determined by the rcoil-distance method (RDM). Gamma-ray angular distributions in exp 198 Pt were also measured. These states were populated by multiple Coulomb excitation using 220-MeV exp 58 Ni ion beams and the measurements carried out in coincidence with backscattered projectiles. The measured mean lives of the states and B(E2) values inferred for the transitions between levels are presented. These specific findings, and the observed structure systematics obtained from the combination of the present results and those of prior workers for the even exp 194 - exp 198 Pt isotopes, are critically compared with our structure calculations employing the Interacting Boson Approximation (IBA) model incorporating a symmetry-breaking quadrupole force. Evaluative comparisons are also made with Boson Expansion Theory (BET) calculations. (Atomindex citation 12:604001)

UM-P-80/59 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Interacting Boson Approximation and the Spectroscopy of the Even Cadmium and Tin Isotopes.
I. Morrison, and R. Smith. 1981, 43p
U.S. Sales Only.

Within the framework of the Interacting Boson Approximation (IBA), the authors investigate, using the even-mass isotopes Cd exp 108 to Cd exp 116 and Sn exp 116 to Sn exp 124 , whether a single two-boson interaction can describe the energy, B(E2), quadrupole moment, and some inelastic nucleon-scattering systematics of these nuclei. (Atomindex citation 12:603918)

UM-P-80/60 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Alpha-Spectroscopic Factors for the Te(D, exp 6 Li)SN and SN(D, exp 6 Li)Cd Reactions in the IBA Model.
I. Morrison, and R. Smith. 1981, 11p
U.S. Sales Only.

Within the framework of the IBA model, alpha -spectroscopic factors are presented for the Te(d, exp 6 Li)Sn and Sn(d, exp 6 Li)Cd reactions. It is shown that inclusion of higher-order terms in the boson-fermion mapping is essential in predicting the correct system-

atics for 2 sub 1+ excitation. (Atomindex citation 12:603919)

UM-P-80/64 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
4 exp - States of exp 16 O.
F. C. Barker, R. Smith, I. Morrison, and K. A. Amos. 1981, 23p
U.S. Sales Only.

A three-state isospin-mixing model is fitted to available data on pion scattering and nucleon pickup relevant to the 4 exp - states of exp 16 O at 17.79, 18.98 and 19.80 MeV. An excellent fit to all data is obtained, and the state descriptions are shown to be consistent with inelastic proton-scattering measurements. The 18.98-MeV state is predominantly 1p-1h T = 1, while the other two states have significant isospin mixing and 3p-3h admixtures. (Atomindex citation 12:603920)

UM-P-80/65 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Isospin Effects in Pion-Nuclear Scattering.
I. Morrison, and K. Amos. 1981, 19p
U.S. Sales Only.

A simple isospin model of inelastic pion-nucleus scattering is discussed, and quantitative results compared with recent experiments on light nuclei. (Atomindex citation 12:603921)

UM-P-80/68 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Photoneutron Cross Section of exp 29 Si.
R. E. Pywell, P. Kean, M. N. Thompson, and B. L. Berman. 1981, 15p
U.S. Sales Only.

The photoneutron cross section of exp 29 Si has been measured over the energy range 8 to 28 MeV using the bremsstrahlung yield curve technique. The giant dipole resonance is observed to be centred at 21.2 MeV and is 5.5 MeV wide. In addition, a pygmy resonance containing much fine structure is observed below 17 MeV. An attempt is made to interpret these observations in terms of the weak coupling of the extra neutron to a exp 28 Si core. However, detailed comparisions of the structure and relative strengths of the exp 28 Si and exp 29 Si cross sections reveal that the coupling of the extra-core nucleon is large and significantly modifies the core wave function. (Atomindex citation 12:604003)

UM-P-80/73 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
High Spin States and Yrast Isomers in exp 211 RN.
A. R. Poletti, G. D. Dracoulis, C. Fahlander, and I. Morrison. 1981, 39p
U.S. Sales Only.

Excited states in exp 211 Rn with spins up to 53/2 have been identified using (HI,xn) reactions and gamma -ray techniques. A shell model calculation can reproduce the ordering of the yrast sequence up to spin 41/2 exp - . Several yrast isomers have been identified. Enhanced E3 transitions are observed and their systematic occurrence in this region discussed. The influence of the neutron hole, and possible core excitations on the effective moment of inertia are also pointed out. (Atomindex citation 12:604004)

UM-P-80/74 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Exp 45 Sc(P,p') exp 45 Sc and the Attainment of a Thermal Ditribution of States in an Astrophysical Environment.
M. R. Anderson, S. R. Kennett, M. E. Sevior, and D. G. Sargood. 1981, 19p
U.S. Sales Only.

Cross sections for inelastic scattering of protons by exp 45 Sc have been measured over the energy range 1.2-2.5 MeV for protons leading to the second, third, fourth, sixth, and eighth excited states of exp 45 Sc. Statistical model calculations were in good agreement with the data. Further statistical model cross section calculations were used in an investigation of the part played in inelastic and superelastic scattering of protons in bringing about a thermal distribution of states in exp 45 Sc in a stellar interior under the conditions of explosive silicon burning. This mechanism was found to be effective for temperatures above 4.5.x.10 exp 9 K. (Atomindex citation 12:604005)

UM-P-80/77 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Neutrino Oscillations in the Early Universe.
B. H. J. McKellar, and H. Granek. 1981, 5p
U.S. Sales Only.

The primordial helium abundance in the Universe is determined principally by the temperature at which the reactions involving electron neutrinos inter-converting protons and neutrons go out of equilibrium. In the presence of neutrino mixing and oscillations there is the possibility that the conversion between neutrino flavours will influence this equilibrium and change the helium abundance. This possibility is investigated in this paper. (Atomindex citation 12:603771)

UM-P-80/86 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Cross Section Measurements and Thermonuclear Reaction Rates for exp 52 Cr(P, gamma) exp 53 MN and exp 54 Fe(P, gamma) exp 55 Co.
S. R. Kennett, L. W. Mitchell, M. R. Anderson, and D. G. Sargood. 1981, 20p
U.S. Sales Only.

The yields of gamma-rays from the reactions exp 52 Cr(p, gamma) exp 53 Mn and exp 52 Cr(p,p' gamma) exp 52 Cr have been measured as a function of bombarding energy over the range 0.84-4.00 MeV, and from the reactions exp 54 Fe(p, gamma) exp 55 Co and exp 54 Fe(p,p' gamma) exp 54 Fe over the range 1.05-3.69 MeV. All gamma -ray yields were lower by factors of order of 2 than those predicted by statistical model calculations based on global parameter sets. Data are taken from the literature for proton induced reactions on exp 48 Ca, exp 50 Ti, and exp 51 V, which like exp 52 Cr and exp 54 Fe contain a closed shell of 28 neutrons, and for which statistical model calculations were also high by factors of order of 2 or more. A new prescription for obtaining the imaginary well depth for the proton channel is proposed for N = 28 nuclei and it is shown to result in a striking improvement in the agreement between experimental and calculated cross sections. (Atomindex citation 12:604006)

UM-P-81/11 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Photoproton Decay of exp 27 Al.
P. J. P. Ryan, M. N. Thompson, K. Shoda, and T. Tanaka. 1981, 25p
U.S. Sales Only.

Photoproton spectra from exp 27 Al were measured from 14.8 to 27.6 MeV excitation energy in 400 keV steps. From these, high resolution photoproton cross sections to low-lying states of the residual exp 26 Mg nucleus were deduced. The large integrated cross sections to these states justify the interpretation of the de-excitation gamma ray measurements which consistently indicate strong population of low-lying residual states following photodisintegration. Further, the results are discussed with reference to the particle-hole model. By examination of the microscopic configurations of the possible GDR states an explanation is proposed for the differences in the cross sections to various residual states. (Atomindex citation 12:604007)

UM-P-81/16 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Cross-Section Measurements and Thermonuclear Reaction Rates for exp 46 Ti(P, gamma) exp 47 V, exp 47 Ti(P, gamma) exp 48 V, exp 47 Ti(P,N) exp 47 V and exp 48 Ti(P, gamma) exp 49 V.
S. R. Kennett, L. W. Mitchell, M. R. Anderson, and D. G. Sargood. 1981, 29p
U.S. Sales Only.

The yield of gamma-rays from the reaction exp 46 Ti(p,gamma) exp 47 V has been measured as a function of bombarding energy over the range 0.72 - 3.00 MeV, from exp 47 Ti(p,gamma) exp 48 V over the range 0.74 - 3.50 MeV, and from exp 48 Ti(p,gamma) exp 49 V over the range 0.72 - 4.40 MeV. The yields of gamma-rays following (p,p') reactions on all three targets were also measured and (p,p') cross sections were deduced for the first excited state proton groups for exp 46 Ti and exp 48 Ti and for the first ten proton groups for exp 47 Ti. The yield of neutrons from the reaction exp 47 Ti(p,n) exp 47 V has been measured over the range from threshold to 4.40 MeV. All these data are compared with statistical-model calculations, and good agreement is achieved. Thermonuclear reaction rates for the (p,gamma) and (p,n) reactions are calculated for the temperature range 5x10 exp 8 -10 exp 10 K which includes the range of temperatures of interest in nucleosynthesis calculations. (Atomindex citation 12:604008)

UM-P-81/2 PC **A03**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Gyromagnetic Ratios of Excited States in exp 198 Pt; Measurements and Interacting Boson Approximation Model Calculations.
A. E. Stuchbery, C. G. Ryan, H. H. Bolotin, I. Morrison, and S. H. Sie. 1981, 32p
U.S. Sales Only.

The enhanced transient: hyperfine field manifest at the nuclei of swiftly recoiling ions traversing magnetized ferromagnetic materials was utilized to measure the gyromagnetic ratios of the 2 sub 1+ , 2 sub 2+ and 4 sub 1+ states in exp 198 Pt by the thin-foil technique. The states of interest were populated by Coulomb excitation using a beam of 220-MeV exp 58 Ni ions. The results obtained were: g(2 sub 1+)=0.324+-0.026; g(2 sub 2+)=0.34+-0.06; g(4 sub 1+)=0.34+-0.06. In addition, these measurements served to discriminate between the otherwise essentially equally probable values previously reported for the E2/M1 ratio of the 2 sub 2+ -2 sub 1+ transition in exp 198 Pt. Interacting Boson Approximation (IBA) model-based calculations were also performed in the O(6) limit symmetry, with and without inclusion of a small degree of symmetry breaking, and employed the M1 operator in both first - and second-order to obtain M1 selection rules and to calculate gyromagnetic ratios of levels. (Atomindex citation 12:604009)

UM-P-81/3 PC **A02**/MF **A01**
Melbourne Univ., Parkville (Australia). School of Physics.
Measurement of the Gyromagneic Ratio of the 937 KeV 3 exp + State in exp 18 F.
A. E. Stuchbery, C. G. Ryan, and H. H. Bolotin. 1981, 18p
U.S. Sales Only.

The gyromagnetic ratio of the 3 sub 1+ state (937-keV excitation energy) in exp 18 F was measured by the time-integral IMPAC technique following implantation in a magnetically saturated Fe foil. The exp 16 O(exp 3 He,p gamma) reaction was employed using 3.75-MeV exp 3 He exp + beams. Measurements of the angular distribution of the de-excitation gamma ray from this level to the ground state and of its precession in the hyperfine field were carried out in coincidence with backward-emitted reaction protons. The sign and magnitude determined for the g-factor of this state is g = +0.54+-0.06. Shell-model calculations of the g-factor of this level have been performed and are evaluatively compared with experiment. (Atomindex citation 12:604010)

UWThPh-80-24 PC **A03**/MF **A01**
Vienna Univ. (Austria). Inst. fuer Theoretische Physik.
Analysis of Horizontal Symmetries in a Minimal SU(2)sub(L)XSU(2)sub(R)XU(1) Gauge Theory.
G. Ecker, W. Grimus, and W. Konetschny. 1980, 34p
U.S. Sales Only.

A left-right symmetric gauge theory of electroweak interactions is considered in which only one Higgs field and its charge conjugate couple to quarks. Among all possible parity transformations those allowing for phenomenologically acceptable mass matrices are singled out. In such a theory arbitrary horizontal symmetry groups with unitary representations are investigated. Both for two and three quark generations essentially only one model emerges which is compatible with empirical constraints on quark masses and mixing angles. (Atomindex citation 12:576821)

UWThPh-80-35 PC **A02**/MF **A01**
Vienna Univ. (Austria). Inst. fuer Theoretische Physik.
Matrix Elements and Decays of Baryons in a Bethe-Salpeter Model with Strong Binding.
P. Falkensteiner. 1980, 19p

U.S. Sales Only.

The experimental consequences of a Bethe-Salpeter model of the baryons proposed by Kielanowski are studied in detail. The model gives good results for the electromagnetic and weak form factors of baryons. When combined with the meson model of Boehm, Joos and Krammer the model gives reasonable values for the strong decay width of baryon resonances. For the S-wave amplitudes of nonleptonic decays the author obtains values with the help of a phenomenological quark-pion vertex. (Atomindex citation 12:576822)

20I. Plasma Physics

AD-A108 799/8 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Level Shifts and Inelastic Electron Scattering in Dense Plasmas.
Memorandum rept.,
J. Davis, and M. Blaha. 10 Dec 81, 35p Rept no. NRL-MR-4689

A completely quantum mechanical formalism has been developed to describe the high density plasma effects on fundamental atomic parameters. Both the bound and free electrons are treated by a method which in principle is similar to Hartree's self-consistent field method. The free plasma electrons' wave-function is obtained from the Schrodinger equation with the effective potential representing the spherically averaged Coulomb interaction with bound and free electrons. Results are given for level shifts, coefficients of transition probabilities, and electron collision cross sections of Ne(9+) for temperature and 200 and 500 e V for an electron density range of 1 - 6 x 10 to the 24th power/cc, and of Ar(17+) for temperatures of 1000 and 2000 eV and electron densities from 2 x 10 to the 25th power to 8 x 10 to the 25th power/cc. In the low-density region, level shifts are obtained for H and He+. (Author)

N82-14936/0 PC **A05**/MF **A01**
Centre National de la Recherche Scientifique, Meudon-Bellevue (France). Lab. d'Aerothermique.
A Thermodynamic Approach to Metal-Plasma Interaction in One-Dimensional Stationary Evolution Une Approche Thermodynamique de l'Interaction Metal-Plasma en Evolution Unidimensionnelle Stationaire.
R. Prudhomme, and M. Dudeck. Jan 81, 88p REPT-81-1, PUBL-638
Text in French.

The production of entropy and phenomenological relations in a thermally unstable plasma are discussed. Evolution of the plasma electric potential is described macroscopically. A metallic surface in the presence of heat transfer and electrical conduction is depicted one dimensionally. A system of difference equations was solved. Expressions for the characteristic equation near equilibrium and for the specific rates of adsorption and desorption in function of electron density, electron energy, and plasma flow are given. The significance of the coefficients of diffusion is pointed out.

N82-14937/8 PC **A08**/MF **A01**
Paris-11 Univ., Orsay (France). Lab. de Physique des Plasmas.
Study of a Discharge Caused by a Surface Wave Etude d'Une Decharge Creee Par Une Onde de Surface.
M. Chaker, P. Nghiem, E. Bloyet, P. Leprince, and J. Marec. May 81, 159p LP-190
Text in French.

A plasma generation theory is elaborated which is based on surface wave propagation characteristics and the hypothesis that the energy absorbed from the wave is proportional to the number of electrons in the plasma, the proportionality factor being independent of the power. Experimentally, the validity of this hypothesis was verified in a rare gas cavity resonator. Direct application of this model makes possible calculation of the effective collision frequency for each experimental condition (excitation frequency). From the collision rate, the mean electron temperature is deduced, assuming a Maxwell distribution. An approximation of losses in the plasma is obtained.

20J. Quantum Theory

PB82-152364 Not available NTIS
National Bureau of Standards, Washington, DC.
Surface-Enhanced Photoabsorption and Photoyield in Small Spheres,
David R. Penn, and R. W. Rendell. Oct 81, 4p
Pub. in Physical Review Letters 47, n15 p1067-1070, 12 Oct 81.

Calculations of the photoabsorption and photoyield of small metal spheres are reported for photon energies below the plasmon energy. It is found that the excitation of electron-hole pairs due to the presence of the surface results in (1) enhancements in the photoabsorption rates and photoyields that are typically 10-100 and (2) similar enhancements in the threshold photoyields of small spheres relative to plane surfaces in agreement with recent exprimental results.

PB82-862533 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
WKB Analysis: Quantum Theory and Quantum Mechanics. 1975-February, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Feb 82.
Feb 82, 124p

This bibliography covers principles, techniques, and results of applying the WKB method in quantum theory and in quantum mechanical interactions of matter and radiation. WKB approximations for a wide variety of quantum processes are considered. (Contains 118 citations fully indexed and includes a title list.)

PB82-862541 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
WKB Analysis: Quantum Theory and Quantum Mechanics. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 105p
Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography cover the WKB method applied to quantum interactions of matter and radiation in a large number of processes involving transference or transformation of energy. WKB approximation and calculations in quantum theory and mechanics are considered with regard to principles, techniques, and results. (Contains 104 citations fully indexed and includes a title list.)

20K. Solid Mechanics

AD-A108 833/5 PC **A03**/MF **A01**
R and D Associates, Marina del Rey, CA.
Stress Pulse Reflection and Tensile Cracking in a One-Dimensional Bilinear Material.
Topical rept. 1 Nov 79-31 Dec 80,
D. A. Simons. 31 Dec 80, 42p RDA-TR-113206-005, DNA-5738T
Contract DNA001-80-C-0069

As a check case for numerical studies of tensile cracking in nonlinear media, closed form solutions have been derived for the following problems. A finite slab of bilinear material is loaded on one face by a sharp-fronted triangular pressure pulse. Cracks are assumed to form in the first case when the stress exceeds a tensile limit for a finite time, i.e., the tensile impulse is finite. In both cases the stress reaches the tensile limit and a first crack forms shortly after the incident wavefront reflects from the free face of the slab. In the first case a continuously cracked zone develops under the action of a tensile spike caused by the first crack. In the second case, the tensile spike has no effect on cracking, and a sequence of discrete cracks form. Stress histories and stress profiles are plotted for both cases. (Author)

AD-A108 975/4 PC **A05**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Program for Nonlinear Structural Analysis.
Final rept. Jan 79-Jun 81,
Robert E. Jones. Sep 81, 77p AFOSR-TR-81-0842
Contract F49620-79-C-0057

The development and evaluation of new theoretical and numerical approaches for strongly nonlinear finite element analysis are reported. The element technology uses interior nodes to create higher order in-plane displacement forms needed for nonlinear strain calculation. Several solution procedure types are discussed, based on an updated total Lagrangian formulation. Progress with this approach and current capability levels are discussed. (Author)

AD-A109 151/1 PC **A02**/MF **A01**
Stanford Univ., CA. Div. of Applied Mechanics.
The Value of Dynamic Fracture Toughness and Its Dependence on Material Properties and Loading Conditions.
Final rept.,
George Herrmann. Dec 81, 6p ARO-14932.8-E
Grant DAAG29-78-G-0086

Investigation of dynamic fracture of long brittle beams under different loading conditions was effected under ARO Grant DAAG29-78-G-0086. The work has proceeded in two distinct areas - the numerical solution of crack propagation problems using a finite difference code and the analytical solution of some beam fracture problems using several one-dimensional theory formulations. (Author)

AD-A109 322/8 PC **A02**/MF **A01**
Battelle Columbus Labs., OH.
Finite Element Analysis of Dynamic Crack Propagation.
Interim rept.,
J. Jung, Jalees Ahmad, M. F. Kanninen, and C. H. Popelar. Mar 81, 24p
Contract N00014-77-C-0576
Prepared in cooperation with Ohio State Univ., Columbus. Dept. of Engineering Mechanics.

A finite element analysis of stationary and propagating cracks in the presence of inertia forces is presented. An extension of the J-integral approach is employed. To model a propagating crack, a conceptually simple yet effective technique has been developed. The new crack propagation scheme eliminates the difficulties associated with the use of moving singular elements. (Author)

AD-A109 403/6 Not available NTIS
Stanford Univ., CA. Dept. of Mathematics.
Stochastically Perturbed Resonance,
John C. Neu. 20 May 80, 6p ARO-17902.7-M
Contract DAAG29-81-K-0032
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v41 n2 p365-369 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14519/4 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Application of Surface Analysis to Solve Problems of Wear.
D. H. Buckley. 1981, 35p NASA-TM-82753, E-1069
Presented at the Ideele Traeger der Surtec Berlin '81, West Germany, 29 Jun. - 3 Jul. 1981.

Results are presented for the use of surface analytical tools including field ion microscopy, Auger emission spectroscopy analysis (AES), cylindrical mirror Auger analysis and X-ray photoelectron spectroscopy (XPS). Data from the field ion microscope reveal adhesive transfer (wear) at the atomic level with the formation of surface compounds not found in the bulk, and AES reveals that this transfer will occur even in the presence of surface oxides. Both AES and XPS reveal that in abrasive wear with silicon carbide and diamond contacting the transition metals, the surface and the abrasive undergo a chemical or structural change which effects wear. With silicon carbide, silicon volatilizes leaving behind a pseudo-graphitic surface and the surface of diamond is observed to graphitize.

N82-14528/5 PC **A02**/MF **A01**
Indian Inst. of Tech., Bombay. Dept. of Aeronautical Engineering.

Coupled Flexural Torsional Vibration of an Eccentrically Stretched Strip.
S. Suryanarayan, and A. Joshi. Mar 81, 14p AE-TN-8131

Flat rectangular strips subjected to an eccentric axial load exhibit coupled transverse lateral torsional modes of vibration. The coupling between the transverse lateral and torsional modes depends on the axial load and the amount of eccentricity. The effect is to increase the torsional frequency and to decrease the transverse lateral frequency.

N82-14532/7 PC **A12**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
A Geometrically Nonlinear Finite Element Shell Theory.
Ph.D. Thesis.
L. J. Ernst. 1981, 265p

A curved triangular thin, elastic finite shell element is presented with expressions for the deformation tensors in terms of cartesian displacement components. In deriving these expressions the element is considered and originally flat plate with initial curvature. Approximations are accepted in the specification of the element geometry. Consequently the expressions for the deformation tensors are approximations are provided. An important parameter used in the error estimates is the maximum slope, theta, of middle surface of the element with respect to its basic triangle. This parameter vanished with continuously decreasing linear dimensions of the elements. Approximate deformation tensors are derived both in terms of displacement components with respect to the original reference position and with respect to a special reference position. The latter description is especially suitable for caes with arbitrary large displacements and rotations, since a possible rigid body motion of the element is separated from the displacement pattern.

N82-14543/4 PC **A12**/MF **A01**
Ecole Nationale Superieure de Techniques Avancees, Paris (France).
Stress-Strain Analysis of Very Thick Plates Analyse des Contraintes et des Deplacements dans les Plaques Tres Epaisses.
Ph.D. Thesis - Paris Univ. 6.
E. D. E. S. Elsoaly. Sep 80, 251p REPT-138
In French; English Summary.

Theoretical, experimental and numerical analyses of thick isotropic homogeneous plates under different loading conditions are presented. The theory takes into account the effects of transverse shear deformation. The analysis uses a variational theorem, having the longitudinal displacements, the transverse shear stresses and the transverse normal stress as variables. The displacement and stress fields are expressed as finite series. Each term of these series is the product of two functions: the first is a given function of the normal transverse variable and the second is an unknown function of the middle plane variables. These expressions are handled as a functional. The third equation of equilibrium and the boundary conditions on the upper and lower surfaces of the plate are satisfied by introducing a Lagrange multiplier which has the significance of a generalized deflection. A complete system of partial differential equations and boundary conditions is sufficient to determine all the unknown functions results.

N82-14862/8 PC **A12**/MF **A01**
Ecole Nationale Superieure de Techniques Avancees, Paris (France).
Linear and Geometric Nonlinear Analysis of Shells by an Isoparametric Three Dimensional Degenerated Element Analyse Lineaire et Non Lineaire Geometrique des Coques Par Elements Finis Isoparametriques Tridimensionnels Degeneres.
Ph.D. Thesis.
G. Fezans. Jan 81, 256p REPT-140
In French; English Summary.

The performances of quadratic and cubic, Serendip and Lagrange elements with normal and reduced integration are compared through plate and shell examples. The performances of these elements in the analysis of thin structures and the problems of numerical conditioning induced by their utilization in this domain are emphasized. The geometric nonlinear formulation of the isoparametric threedimensional degenerated elements is presented. A total Lagrangian formulation was used. The nonlinear problem is solved by a modified Newton-Raphson method with incremental loading. Examples of highly nonlinear problems demonstrate the effectiveness of the element.

N82-14878/4 PC **A04**/MF **A01**
Aeronautical Research Associates of Princeton, Inc., NJ.
A Study of the Viscous Dissipation and Surface Loading on a Vibrating Surface.
Progress Report.
J. E. Yates. Dec 81, 51p NASA-CR-3499, ARAP-451
Contract NAS1-16365

The energy dissipated by viscosity at the edge of a vibrating flat plate is calculated and compared to the radiated acoustic energy. A correction to the Kirchhoff integral estimate of the noise is derived. For Helmholtz number of order unity and smaller the dissipation can be comparable to or greater than the acoustic energy. A viscous compressible theory of the load distribution on a vibrating two dimensional body is developed. First it is shown that load calculations based on potential theory and the Newmann uniqueness condition (continuity of potential or pressure on the surface) are not in agreement with experiment or the more correct viscous theory. For a flat plate airfoil the eigensolution of potential theory is indeterminant while viscous theory yields a unique solution that has square root singularities at the edges. It is also shown that for compact surfaces the far field acoustics depend only on the magnitude of the eigensolutions of potential theoy and so will be uniquely determined by the viscous theory. It is suggested that the general viscous theory of vibrating surfaces with cross sectional geometry will lead to results in agreement with expermentally measured load distributions.

20L. Solid-State Physics

AD-A108 870/7 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Chemistry.
SIMS Studies on Anomalous Behavior of Phosphorus and Other Implants in Silicon.
Interim technical rept.,
Paul K. Chu, Dachang Zhu, and George H. Morrison. 17 Dec 81, 22p Rept no. TR-6
Contract N00014-80-C-0538

A phosphorus implant in p-type silicon was analyzed by SIMS, and both the implant profile and the matrix signal were observed to exhibit some anomalous behavior. Further studies revealed the same behavior in other implants. This phenomenon was observed when an n-type dopant was implanted into a p-type matrix, or vice versa. However, some exceptions arose, making the interpretation difficult. The use of matrix signal normalization was adopted and found to improve the results. (Author)

AD-A108 916/8 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Optical Interferometric Measurement of the Thermal Expansion of NdP5O14.
Journal article,
William E. Barch, Walter K. Zwicker, and Stephen R. Chinn. 17 Oct 80, 4p JA-5154, ESD-TR-81-321
Contract F19628-80-C-0002
Pub in Jnl. of Applied Physics, v52 n5 p3388-3390 May 81.

No abstract available.

AD-A108 982/0 PC **A02**/MF **A01**
Northwestern Univ., Evanston, IL. Dept. of Physics and Astronomy.
Electronically Induced Phase Transformations.
Interim scientific rept. 1 Oct 80-30 Sep 81,
Arthur J. Freeman. 30 Nov 81, 11p AFOSR-TR-81-0866
Grant AFOSR-81-0024

The electronic interactions responsible for the observed electronically induced phase transformations in several important classes of materials were investigated theoretically in close collaboration with experimental programs at other institutions. These include the high field superconductivity of Chevrel phase compounds and the first theoretical demonstration that the Jaccarino-Peter mechanism is responsible for the large increase in the upper critical field when large concentrations of Eu magnetic impurities are added to SnMo6S8, an extensive study of the unusual magnetic and superconducting properties of some C15 compounds, self-consistent energy band calculations including all electrons and all atoms in the 16 atoms per unit cell of the linear chain transition metal trichalcogenide, TaSe3, and the first demonstration of the onset of a metamagnetic transition in Pd Metal. (Author)

AD-A109 033/1 PC **A03**/MF **A01**
Stanford Univ., CA. Solid State Electronics Lab.
Ion Implantation and Laser Processing of III-V Compound Semiconductors with Applications to the Fabrication of Microwave Devices.
Final rept. 1 Jun 78-31 May 81,
James F. Gibbons. Oct 81, 44p ARO-15605.5-EL
Grant DAAG29-78-G-0119

Research was carried out on laser processing of III-V Compound semiconductors, concentrating on the mechanisms that are responsible for annealing ion implanted dopants in GaAs and on the possibility of obtaining laser-assisted diffusion of dopants. Seven papers describing this work have been written during the period covered by this report. A brief overview of these papers is given. The full papers are attached for detailed presentation of experimental conditions, theoretical calculations and results. (Author)

AD-A109 070/3 PC **A04**/MF **A01**
Honeywell Corporate Technology Center, Bloomington, MN.
Nonlinear Optical Effects in Hg(1-x)CdxTe,
Paul W. Kruse, and John F. Ready. 1981, 62p
AFOSR-TR-81-0835
Contract F49620-77-C-0028
Pub. in Semiconductors and Semimetals, v16 p193-253 1981.

No abstract available.

AD-A109 075/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Physics.
Nonlinear Absorption Due to Shallow Donors in Germanium at 10.6 Micrometers.
Rept. for Dec 80-Oct 81,
P. A. Wolff, J. B. McManus, R. People, and R. L. Aggarwal. 5 Dec 80, 6p AFOSR-TR-81-0837
Contract F49620-80-C-0008
Pub. in Jnl. of Applied Physics, v52 n7 p4748-4752 Jul 81.

No abstract available.

AD-A109 142/0 PC **A02**/MF **A01**
Stanford Univ., CA.
The Electronic and Atomic Structure of Diamond Surface and Effects of Hydrogen Termination.
Final rept. 1 Jul 78-30 Jun 81,
B. B. Pate, P. J. Jupiter, I. Lindau, and W. E. Spicer. 2 Nov 81, 21p ARO-15878.3-P
Grant DAAG29-78-G-0130

The electronic and atomic structure of the diamond (111) surface and the effects of hydrogen termination are studied using photoemission, photon stimulated desorption, low energy electron diffraction, and Auger electron spectroscopy. Hydrogen termination results in a 1 x 1 surface with no filled surface states in or near the band gap region. A high temperature anneal (approx. 1000 degrees C) removes the hydrogen and results in a 2 x 2/2 x 1 surface structure. (Author)

AD-A109 226/1 Not available NTIS
Delaware Univ., Newark. Dept. of Physics.
High-Field Electroluminescence,
Ferd Williams. 15 Mar 81, 16p ARO-16048.2-P
Grant DAAG29-79-G-0039
Availability: Pub. in Jnl. of Luminescence, v23 p1-16 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 228/7 Not available NTIS
Oklahoma State Univ., Stillwater. Dept. of Physics.
Measurement of Exciton Diffusion Lengths in Nd(x)La(1-x)P5O14 by Four-Wave Mixing Techniques,
Christopher M. Lawson, Richard C. Powell, and Walter K. Zwicker. 21 Nov 80, 5p ARO-16182.9-P
Contract DAAG29-79-C-0052

Availability: Pub. in Physical Review Letters, v46 n15 p1020-1023, 13 Apr 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 243/6 Not available NTIS
Massachusetts Inst. of Tech., Cambridge.
Structural Energies of Al Deposited on the GaAs(110) Surface,
J. Ihm, and J. D. Joannopoulos. 1981, 5p ARO-17209-20-EL
Contract DAAG29-80-C-0104
Availability: Pub. in Physical Review Letters, v47 n9 p679-682, 31 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A109 265/9 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Cathodoluminescence Analysis of Polycrystalline GaAs.
Journal article,
Jack P. Salerno, John C. Fan, and Ronald P. Gale. 1981, 6p MS-5532, ESD-TR-81-309
Contract F19628-80-C-0002
Pub. in Proceedings of the Fifteenth IEEE Photovoltaic Specialists Conference, p1174-1178 Jun 81.

No abstract available.

AD-A109 401/0 Not available NTIS
California Univ., Los Angeles. Dept. of Physics.
Optical Properties of the Surface Plasmon of n(+) Silicon,
P. F. Robusto, and R. Braunstein. 25 May 81, 13p ARO-14249.6-P
Grant DAAG29-79-G-0047
Availability: Pub. in Physica Status Solidi (b), v107 p127-138 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

N82-14308/2 PC **A04**/MF **A01**
Honeywell Electro-Optics Operations, Lexington, MA.
Defect Chemistry and Characterization of (Hg, Cd)Te.
Interim Report, 1 Jan. - 30 Jun. 1981.
H. R. Vydyanath. 30 Jun 81, 51p NASA-CR-161928
Contract NAS8-33245

Single crystal samples of phosphorus doped Hg sub 0.8 Cd sub 0.2 Te were annealed at temperatures varying from 450 C to 600 C in various Hg atmospheres. The samples were quenched to room temperature from the annealing temperatures. Hall effect and mobility measurements were performed at 77 K on all these samples. The results indicate the crystals to be p type for a total phosphorus concentration of 10 to the 19th power/cu cm in all the samples. The hole concentration at 77 K increases with increasing Hg pressures at 450 C and 500 C contrary to the observation in undoped crystals. Also, at low Hg pressures the concentration of holes in the phosphorus doped crystals is lower than in the undoped crystals. The hole concentration in all the samples is lower than the intrinsic carrier concentration at the annealing temperatures. The hole mobility in the doped crystals is similar to that in the undoped crystals. A defect model according to which phosphorus behaves as a single acceptor interstitially, occupying Te lattice sites while it acts as a single donor occupying Hg lattice sites was established. Equilibrum constants established for the incorporation of all the phosphorus species explain the experimental results

N82-14951/9 PC **A04**/MF **A01**
Max-Planck-Inst. fuer Festkoerperforschung, Stuttgart (Germany, F.R.).
Preparation of GaAs/Al(x)Ga(1-x)As Multilayer Structures with Predetermined Optical and Electrical Properties by Molecular Beam Epitaxy.
Final Report, Jun. 1980.
K. Ploog, and A. Fischer. Feb 81, 68p BMFT-FB-T-81-042, ISSN-0340-7608
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

Semiconductor structures of GaAs-AlAs multilayers were developed for fundamental research microwave technology and optoelectronics applications. Measuring and evaluation procedures for molecular beam epitaxy (MBE) layers and semiconductor diodes were elaborated. Two semiconductor structures were studied: (1) periodic p/n doping multilayer structures ('nipi' structures) in GaAs consisting of a periodic sequence of ultrathin alternating p and n-doped GaAs layers, possibly with intrinsic (i-) layers in between, and (2) one-sided abrupt GaAs/n+-AlXgAl-XAs heterostructures producing two-dimensional carrier confinement and enhanced mobilities at the interface. The method performs better than previous MBE technologies.

PB82-149105 Not available NTIS
National Bureau of Standards, Washington, DC.
Gap Enhancement in Aluminum Tunnel Junctions Coupled to Microstrip Resonators.
Final rept.,
L. B. Holdeman, James T. Hall, D. Van Vechen, and R. J. Soulen, Jr. 1981, 11p
Sponsored in part by National Aeronautics and Space Administration, Washington, DC.
Pub. in Physica 108B, p827-828 1981.

Irradiated (9.7 GHz) Al films show gap enhancement that agrees with Eliashberg's theory.

PB82-149170 Not available NTIS
National Bureau of Standards, Washington, DC.
Dielectric Function for Ultraviolet Plasmons in the Short-Lifetime Limit.
Final rept.,
H. A. Fowler, and J. J. Filliben. Nov 81, 3p
Pub. in Jnl. Applied Physics 52, n11 p6701-6703 1981.

The 'inverted' Drude-Sellmeier formula, for a two-parameter free-electron-gas spectrum of plasmon excitations, is evaluated for very large values of the line breadth. These function values for 1/epsilon(omega) characterize a solid dominated by a free-electron plasma with short 'damping time', over the ultraviolet range. A rounded energy-loss distribution is suggested at the critical damping limit.

PB82-149824 Not available NTIS
National Bureau of Standards, Washington, DC.
Elastic Constants of Polycrystalline Copper at Low Temperatures.
Final rept.,
H. M. Ledbetter. 1981, 8p
Sponsored in part by Stiftung Volkswagenwerk,, Hanover (Germany, F.R.).
Pub. in Physica Status Solidi A 66, p477-484 1981.

Elastic constants of polycrystalline copper are determined between 4 and 295 K by measuring ultrasonic velocities, longitudinal and transverse. Five elastic constants are given: longitudinal modulus, shear modulus, Young's modulus, bulk modulus (reciprocal compressibility), and Poisson's ratio. Considering eight theories of single-crystal:polycrystal elastic constants, the Hershey-Kroner-Eshelby theory agrees best with observation, within 1% for the shear modulus. A problem exists concerning the calculation of the Debye temperature of polycrystalline aggregates.

PB82-152570 Not available NTIS
National Bureau of Standards, Washington, DC.
Spin Polarization in Electron Scattering from Surfaces,
D. T. Pierce, and R. J. Celotta. 1981, 71p
Sponsored in part by Office of Naval Research, Arlington, VA.
Pub. in Advances in Electronics and Electron Physics 56, p219-289 1981.

A summary is presented of modern experimental and theoretical treatments of electron spin polarization phenomena in low energy electron scattering from solids. Relativistic and exchange interactions are treated separately. The use of polarization measurements for surface structure determinations and the investigation of surface magnetism is emphasized. A total of 105 references are given.

PB82-152737 Not available NTIS
National Bureau of Standards, Washington, DC.
The Superconductive Energy Gap of AuAl(2),
R. J. Soulen, Jr., D. Van Vechten, G. Costabile, Terrence Jach, and L. B. Holdeman. 1981, 2p
NASA Order-H-27908B
Pub. in Physica 108B, p823-824 1981.

Two hundred nm films of AuA2 were prepared. The superconductive transition determined by resistive measurements were found to vary from film to film, from 177 to 184 mK, and the transition widths varied between 6 and 15 mK. Film surfaces were oxidized by the Greiner process and Al counter electrodes were deposited in order to produce tunnel junctions. The temperature dependence of the energy gap of AuAl2 was measured and found to agree well with BCS theory.

PB82-803933 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Handbooks on Physics. 1964-1981 (Citations from the NTIS Data Base).
Jan 82, 80p
Supersedes PB80-815509, and NTIS/PS-79/0964.

Handbooks covering the various fields of physics are cited in this bibliography. Works dealing with solid state physics, nuclear and particle physics, optics, and thermodynamics are cited. As used here, the term 'handbooks' refers to documents useful for reference purposes rather than as sources of instruction. (This updated bibliography contains 73 citations, 3 of which are new entries to the previous edition.)

20M. Thermodynamics

AD-A109 271/7 PC **A02**/MF **A01**
Stanford Univ., CA. Edward L. Ginzton Lab. of Physics.
Acoustic Microscopy at Cryogenic Temperatures.
Annual summary rept. 1 Jul 80-30 Jun 81,
C. F. Quate, and J. Heiserman. Nov 81, 13p Rept no. GL-3369
Contract N00014-77-C-0412

This report summarizes our progress in a research program devoted to high resolution acoustic microscopy and cryogenic temperatures. During the past year we have studied the acoustic properties of two cryogenic fluids - liquid argon and liquid 4He below the temperature of 0.5 degrees K. In argon we have determined that nonlinear effects provide us with a dramatic increase in resolving power for focused acoustic beams. In liquid helium we have measured the attenuation versus temperature of sound at 1 GHz where the wavelength is less than 2500 A. The predicted behavior below 0.5 degrees K where the attenuation varies as the fourth power of temperature is confirmed for the first time at these small wavelengths. It gives us further confidence in our program to realize an instrument that will permit us to examine our specimens with an acoustic probe that is less than 1000 A in diameter.

PB82-152489 Not available NTIS
National Bureau of Standards, Washington, DC.
A Correlation of Thermal Conductivity Data for Helium.
Final rept.,
B. A. Hands, and V. D. Arp. Dec 81, 7p
Pub. in Cryogenics 21, n12 p697-703 Dec 81.

A correlation for the thermal conductivity of helium has been developed which covers the temperature range from temperatures just above the lambda line to 830K, and densities up to about 160/cu kgm. The data used incorporate some recent experimental results which cover the temperature range from 4K to 20K including the critical region. The correlation gives an equation which is probably correct to better than + or - 6%.

20N. Wave Propagation

AD-A108 905/1 PC **A02**/MF **A01**
Alaska Univ., Fairbanks. Geophysical Inst.
Ionosphere Research.
Final rept.,
Robert Hunsucker, and Robert Freyman. 12 Nov 81, 8p
Contract DASG60-80-C-0047
Includes Rept. no. LA-UR-81-749 dated Apr 81.

The aim of the contract between BMC/ATC and the Geophysical Institute of the University of Alaska (GI/UAF) has been to provide support for Mr. Robert Freyman of Los Alamos National Laboratories (LANL) to

conduct investigations of the long-delay-echo (LDE) phenomenon at field sites in the auroral zone.

N82-14435/3 PC **A04**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
Results of the Propagation Measurements at 94 Ghz over a 935 M Link on the Ypenburg Airfield.
C. D. Dehaan. Oct 79, 52p PHL-1979-43, TDCK-73422

Extremely high frequency propagation data and meteorological measurements, including rain rate along the propagation path, windspeed and wind direction in the horizontal plane, the atmospheric temperature, pressure and humidity and raindrop size distribution are given for a vertically polarized Cassegrain antenna link. Actually measured raindrop size distribution and spherical raindrops, were used to measure the attenuation caused by rain using Mie's scattering theory for water spheres. It is noted that in fog, the attenuation is small for millimeter waves and high for infrared waves. Data are collected from point visibility meters, ombrometers and rapid response rain gages.

N82-14436/1 PC **A02**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
Further Results of the Propagation Measurements at 94 Ghz over a 935 M Link on the Ypenburg Airfield.
J. H. Buijs. Dec 80, 22p PHL-1980-46, TDCK-75028

The effects of rain, snow, and wet snow on vertically and horizontally polarized Cassegrain antenna link 94 GHz waves are reported. Data were collected from point visibility meters, ombrometers, and rapid response rain gages. It is noted that water effect is the same in both cases. Rain effect is described by the calculated rain attenuation based on measured drop size distributions and spherical raindrops. Snow gives a slightly higher attenuation than rain at the same equivalent rain rate for vertical polarization.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A108 977/0 PC **A09**/MF **A01**
University of Southern California, Los Angeles. Dept. of Mechanical Engineering.
1981 AFOSR Contractors Meeting on Air Breathing Combustion Dynamics and Explosion Research, 16-20 November 1981, Clearwater Beach, Florida.
Interim rept.,
B. T. Wolfson, N. Gerstein, and Roy Choudhury. Sep 81, 199p AFOSR-TR-81-0844
Grant AFOSR-77-3354

The report consists of a collection of expanded abstracts of the numerous research progress reports given by AFOSR supported contractors on the Air Force basic research program on Energy Conversion Related to Air-Breathing Propulsion and Explosions and of invited papers from other governmental agencies and contractors. These papers presented over a five-day period composed the 1981 contractors meeting on Air-Breathing Combustion Dynamics and Explosion Research. The principal investigators and their organizational association are also identified. (Author)

AD-A109 057/0 PC **A05**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Aeronautical and Astronautical Engineering.
Initiation, Combustion and Transition to Detonation in Homogeneous and Heterogeneous Reactive Mixtures: A Summary.
Final rept. 1 Jun 80-31 May 81,
Roger A. Strehlow, Harold O. Barthel, and Herman Krier. Sep 81, 76p AFOSR-TR-81-0840
Grant AFOSR-77-3336

Certain aspects of ignition source effects in reactive fuel-air mixtures are discussed. These aspects include effects of chemical sensitizers, flame acceleration, flame area, and ignition point location. The other area involves the hydrodynamic modeling of ignition and flamespreading in granular energetic solids to predict the potential for deflagration-to-detonation transition (DDT). Key results in the first area are that chemically sensitized clouds can lead to detonation, that flame acceleration or a large increase in the time rate of increase of the flame area are needed for transition from deflagration to detonation and that it is very difficult to generate damaging overpressure from edge-ignited combustion even for very high subsonic burning velocities. The research dealing with analysis of DDT in porous high energy solid propellant has shown (for the first time) actual steady-state detonation solutions, following the unsteady flow, for materials with sufficient porosity and critical burning rate properties. Limits of the run-up length to detonation are predicted as a function of propellant chemical energy, burning rate, bed porosity, and granulation (size). The detonation states conform to realistic measured conditions for porous HMX and RDX propellants.

AD-A109 058/8 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. School of Aeronautics and Astronautics.
Determination of the Combustion Mechanisms of Aluminized Propellants.
Annual rept. 1 Oct 80-30 Sep 81,
J. P. Renie, H. M. Pressley, J. S. Lilley, and J. R. Osborn. 26 Oct 81, 11p AFOSR-TR-81-0839
Grant AFOSR-77-3381

This research project is concerned with determining the mechanisms governing the formation and combustion of metal/agglomerate/metal oxide particles throughout the solid rocket motor, that is, surface/near surface, cavity, and nozzle regions. Also of concern is the influence these particles have on propellant combustion characteristics and motor performance. The efforts of this past year were directed toward developing the experimental equipment needed for determining particle size distributions at and near the propellant surface. A solid propellant strand window bomb with a servo controlled positioning device was constructed and operated. Also, the interface of this equipment with data recording and reduction equipment was accomplished. The laser imaging device to be used to measure particle size distributions is undergoing calibration tests. (Author)

21C. Electric Propulsion

N82-14281/1 PC **A03**/MF **A01**
Lockheed Missiles and Space Co., Inc., Sunnyvale, CA.
Solar Cell Modules for Plasma Interaction Evaluation.
Final Report.
15 Oct 81, 47p NASA-CR-161922, LMSC-D794945
Contract NAS8-34026

A plasma interaction analysis in support of the solar electric propulsion subsystem examined the effects of a large high voltage solar array interacting with an ion thruster produced plasma. Two solar array test modules consisting of 36 large area wraparound contact solar cells welded to a flexible Kapton integrated circuit substrate were abricated. The modules contained certain features of the effects of insulation, din-holes, and bonding of the cell to the substrate and a ground plane. The possibility of a significant power loss occurring due to the collection of charged particles on the solar array interconnects was the focus of the research.

21D. Fuels

AD-A109 182/6 PC **A05**/MF **A01**
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
An Overview of Army Mobility Energy Research and Development.
Interim rept. Jun 79-Oct 81,
Leo L. Stavinoha, Gayla S. Cauldwell, and Maryland B. Kemp. Oct 81, 82p Rept no. AFLRL-146
Contracts DAAK70-78-C-0001, DAAK70-80-C-0001

Dependence on foreign oil sources and the attendant strategic problems of securing the long lines of supplies from possible interruption raise a question of the ability of the Armed Forces to carry out its mission in the event of a national emergency. Energy is essential for the Army in maintaining readiness to assure national security in peacetime, crisis, or war. The Army Energy Plan, which is in concert with and support of national energy goals, establishes the basis for reducing energy consumption, reducing dependency on conventional hydrocarbon fuels, and tasks the Army to obtain a position of energy leadership. In this report, the Department of Army Energy goals/objectives are identified and the framework for planning Army Mobility/Energy/Research and Development is outlined. Key elements of the Army Mobility Energy R and D plan of action include an organization plan, technical assessment, technical performance plan, and a management plan. The Army Mobility Energy R and D Program has been categorized into four program areas--fuels, other fluids, engines, and other equipment. Examples of individual projects, as well as an overview of the Army's Mobility Energy Research and Development are provided with respect to meeting Army Energy goals. (Author)

AD-A109 307/9 PC **A07**/MF **A01**
Air Force Engineering and Services Center, Tyndall AFB, FL. Engineering and Services Lab.
Evaporation and Groundfall of JP-4 Jet Fuel Jettisoned by USAF Aircraft.
Final rept. Feb 72-Jun 80,
Harvey J. Clewell, III . Sep 80, 131p Rept no. AFESC/ESL-TR-80-56

An experimental and modeling effort was undertaken to determine the physical fate of JP-4 jet fuel discharged from an aircraft in flight. A computer model was developed to simulate evaporation and free-fall of fuel droplets in the atmosphere. In order to apply this model to jettisoned fuel, an experimental study was performed to determine the droplet size distribution produced by the jettisoning process. This study featured in-flight sampling of the fuel plume from a KC-135 tanker aircraft. Sampling was also performed at ground level to determine whether the jettisoned fuel reached the ground in significant concentrations. For fuel jettisoning as low as 750 meters above the ground at temperatures around 11 C, no liquid fuel could be detected by ground observers and no significant hydrocarbon concentrations (greater than a few ppm C) were measured by the sampling.

AD-A109 412/7 Not available NTIS
Northwestern Univ., Evanston, IL.
On the Fire Resistant Nature of Oil/Water Emulsions,
Chung K. Law. 3 Feb 81, 4p ARO-15102.9-E
Grant DAAG29-77-G-0188
Availability: Pub. in Fuel, v60 p998-999 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

DE82900385 PC **A02**/MF **A01**
Canada Centre for Mineral and Energy Technology, Ottawa (Ontario).
Effect of Heated Diesel Fuel on Particulate Generation and Fuel Consumption for a Deutz F6L 912W Engine.
E. D. Dainty, and J. P. Mogan. Jun 80, 10p ERP/ERL-80-65(TR)
U.S. Sales Only.

Light diesel fuel (SG = 0.805) was employed in a dynamometer-coupled Deutz F6L 912W indirect injection diesel engine, in both a cold and a hot condition, in order to determine the effects of fuel temperature on fuel consumption and on the concentrations of CO and carbon particulate matter in the exhaust gases generated at near maximum load/speed operating conditions. Three test runs on three different days indicated that, for a given engine torque and speed, and fuel temperature increases from 75 exp 0 F/24 exp 0 C to 180 exp 0 F/83 exp 0 C: no significant, variation in fuel flow rate was observed; no significant overall variation in the generation of particulate matter was observed;

and a minor 12% reduction in the generation of CO was observed (i.e., 210 ppM to 185 ppM approximately). Consequently, it does not appear that this emissions reduction strategy is useful in underground applications where IDI engines are widely used. (ERA citation 07:004911)

MEDDELELSE-37 PC **A08**/MF **A01**
Kongelige Veterinaer- og Landbohoejskole, Copenhagen (Denmark). Jordbrugsteknisk Inst.
Regional Analysis of Potential Energy Production from Agricultural Wastes: A Technical and Economic Study.
H. Have. Sep 79, 162p
U.S. Sales Only.

The possibilities for utilization of agricultural wastes for energy production are analyzed in two Danish counties, Ringkoebing and Vestsjaelland, which have different agricultural production patterns. The quantitative analysis shows that the major waste products, surplus straw, waste wood and animal waste, in total with present technique can cover about 28% of the demand for heat energy (mostly space heating) in both counties. The potential coverage from straw, wood and animal waste is about 3, 3 and 22% in Ringkoebing and 18, 2 and 8% in Vestsjaelland, respectively. A technical analysis indicates that direct combustion in the most favorable conversion method for straw and wood while biological conversion at present is best suited for animal waste. An economic analysis based on costs of collection, storage, transport and conversion of wastes and costs of corresponding oil and oil conversion were made. From a community point of view only straw and wood are found to be competitive to the expensive gas fuel oil when burned in automatically stoked furnaces. From a heating station point of view waste utilization is more attractive because of the sales tax on oil products. Here straw and wood are competitive fuels to both gas and heavy fuel oil in all the analyzed systems except from the small manually stoked furnaces. Animal waste seems to be competitive only when replacing gas fuel oil in medium size (500 kW) well utilized aerobic ferementeres. Apart from being economically attractive in many cases waste utilization for energy production also has positive effects on foreign payment balance, employment and supply safety. In addition it has advantages in reducing fire hazard by field burning of straw, sulphur pollution, odor emission and parasite infection from animal waste. (ERA citation 06:034988)

PB82-152224 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Strategic Petroleum Reserve: Substantial Progress Made, but Capacity and Oil Quality Concerns Remain.
Report to the Congress.
31 Dec 81, 65p EMD-82-19

The report discusses efforts since July 1980 to fill the reserve. It makes recommendations to the Secretary of Energy concerning the availability of storage capacity and the quality of oil stored in the reserve. It also includes matters for consideration by the Congress during the fiscal year 1983 budget process.

PB82-152539 Not available NTIS
National Bureau of Standards, Washington, DC.
Determination of Tetraalkyllead Compounds in Gasoline by Liquid Chromatography--Atomic Absorption Spectrometry.
Final rept.,
J. D. Messman, and T. C. Rains. Sep 81, 5p
Pub. in Analytical Chemistry 53, n11 p1632-1636 Sep 81.

A liquid chromatography--atomic absorption spectrometry (LC-AAS) hybrid analytical technique is presented for metal speciation measurements on complex liquid samples. The versatility and inherent metal selectivity of the technique are illustrated by the rapid determination of five tetraalkyllead compounds in commercial gasoline. Separation of the individual tetraalkyllead species is achieved by reversed-phase liquid chromatography using an acetonitrile/water mobile phase. The effluent from the liquid chromatograph is introduced directly into the aspiration uptake capillary of the nebulizer of an air/acetylene flame atomic absorption spectrometer. Spectral interferences due to coeluting hydrocarbon matrix constituents were not observed at the 283.3 nm resonance line of lead used for analysis. Detection limits of this LC-AAS hybrid analytical technique, based on a 20-microliter injection, are approximately 10 ng Pb for each tetraalkyllead compound.

PB82-861675 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solid Waste Resource Recovery Facilities. 1976-February, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Feb 82.
Feb 82, 262p
Supersedes PB81-856429.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning utilization of solid waste as an energy source. Technical, economic, and environmental impacts of these facilities are considered. Existing facilities are assessed, and proposed sites are discussed. (This updated bibliography contains 267 citations, 140 of which are new entries to the previous edition.)

21E. Jet and Gas Turbine Engines

AD-A108 807/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Gas Turbine Ceramic-Coated-Vane Concept with Convection-Cooled Porous Metal Core.
Technical paper,
Albert F. Kascak, Curt H. Liebert, Robert F. Handschuh, and Lawrence P. Ludwig. Dec 81, 14p NASA-E-732, NASA-TP-1942, USAAVRADCO-TR-81-C-7

Analysis and flow experiments on a ceramic-coated-porous-metal vane concept indicated the feasibility, from a heat transfer standpoint, of operating in a high-temperature (1644 K; 2500 deg F) gas turbine cascade facility. The heat transfer and pressure drop calculations provided a basis for selecting the ceramic layer thickness (to 2.03 mm; 0.08 in.), which was found to be the dominant factor in the overall heat transfer coefficient. Also an approximate analysis of the heat transfer in the vane trailing edge revealed that with trailing-edge ejection the ceramic thickness could be reduced to 0.254 mm (0.01 in.) in this portion of the vane. (Author)

AD-A109 292/3 PC **A15**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Propulsion and Energetics Panel Working Group 12 on through Flow Calculations in Axial Turbomachines.
Advisory rept.,
Ch. Hirsch, and J. D. Denton. Oct 81, 332p Rept no. AGARD-AR-175

The objectives of these efforts were to review the existing information on blade performance and wall effect prediction, and to extend this information by systematic application of numerical methods to representative geometries. In its performance period Working Group 12 had confined to axial turbomachines only and split into a Turbine Sub-Group and a Compressor Sub-Group. In the Turbine Sub-Group five correlations were reviewed and evaluated against the test cases. Each correlation had its strengths and weaknesses and room for further improvements. The Compressor Sub-Group report begins with a comprehensive survey of the various loss and deviation mechanisms. For comparison of the prediction methods to the test cases five authors have used their own correlations, while the sixth employed a single code in conjunction with three correlations for the four stage compressor. The results of the evaluation are similar to those of the Turbine Sub-Group, but the spanwise parameter distribution is often poorly predicted. This Advisory Report was prepared at the request of the Propulsion and Energetics Panel of AGARD.

N82-14051/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Analytic Investigation of Effect of End-Wall Contouring on Stator Performance.
R. J. Boyle, H. E. Rholik, and L. J. Goldman. Nov 81, 12p NASA-TP-1943, E-719

Calculations show improved stator performance when the tip end wall was contoured so that the inlet area was greater than the exit area. Comparisons are made with previously published experimental data. The results of a parametric analysis of the effect contour geometry on the efficiency of a highly loaded axial stator are given. The maximum stator efficiency gain is about 0.8 percentage point, and this represents a 22 percent reduction in stator losses. The degree to which end-wall contouring reduces the forces driving secondary flows was also examined. The driving forces for both cross channel and radial secondary flow were reduced.

N82-14090/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Gas Turbine Ceramic-Coated-Vane Concept with Convection-Cooled Porous Metal Core.
A. F. Kascak, C. H. Liebert, R. F. Handschuh, and L. P. Ludwig. Dec 81, 14p NASA-TP-1942, AVRADCOM-TR-81-C-7
Sponsored in Part by U.S. Army Aviation Research and Development Command, St. Louis.

Analysis and flow experiments on a ceramic-coated-porous-metal vane concept indicated the feasibility, from a heat transfer standpoint, of operating in a high-temperature (2500 F) gas turbine cascade facility. The heat transfer and pressure drop calculations provided a basis for selecting the ceramic layer thickness (to 0.08 in.), which was found to be the dominant factor in the overall heat transfer coefficient. Also an approximate analysis of the heat transfer in the vane trailing edge revealed that with trailing-edge ejection the ceramic thickness could be reduced to (0.01 in.) in this portion of the vane.

N82-14092/2 PC **A10**/MF **A01**
General Electric Co., Cincinnati, OH. Aircraft Engine Business Group.
Core Compressor Exit Stage Study. Volume 4: Data and Performance Report for the Best Stage Configuration.
Final Report.
D. C. Wisler. Apr 81, 204p NASA-CR-165357, R80AEG314-V-4
Contract NAS3-20070

The core compressor exit stage study program develops rear stage blading designs that have lower losses in their endwall boundary layer regions. The test data and performance results for the best stage configuration consisting of Rotor-B running with Stator-B are described. The technical approach in this efficiency improvement program utilizes a low speed research compressor. Tests were conducted in two ways: (1) to use four identical stages of blading to obtain test data in a true multistage environment and (2) to use a single stage of blading to compare with the multistage test results. The effects of increased rotor tip clearances and circumferential groove casing treatment are evaluated.

N82-14093/0 PC **A06**/MF **A01**
General Electric Co., Cincinnati, OH. Aircraft Engine Business Group.
Core Compressor Exit Stage Study. Volume 5: Design and Performance Report for the Rotor C/Stator B Configuration.
D. C. Wisler. May 81, 101p NASA-CR-165358, R81AEG287-V-5
Contract NAS3-20070

Rear stage blading designs that have lower losses in their endwall boundary layer regions were developed. The design of rotor-C and the performance results for rotor-C running with stator B are described. A low speed research compressor is utilized as the principal investigative tool. Four identical stages of blading are used to obtained data in a true multistage environment.

N82-14094/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
The Use of Optimization Techniques to Design Controlled Diffusion Compressor Blading.
N. L. Sanger. 1982, 18p NASA-TM-82763, E-1084
Proposed for Presentation at the 27TH Ann. Intern. Gas Turbine Conf., London, Apr. 18-22, 1982; Sponsored by Asme.

A method for automating compressor blade design using numerical optimization, and applied to the design of a controlled diffusion stator blade row is presented. A general purpose optimization procedure is employed, based on conjugate directions for locally unconstrained problems and on feasible directions for locally constrained problems. Coupled to the optimizer is an analysis package consisting of three analysis programs which calculate blade geometry, inviscid flow, and blade surface boundary layers. The optimizing concepts and selection of design objective and constraints are described. The procedure for automating the design of a two dimensional blade section is discussed, and design results are presented.

N82-14095/5 PC **A09**/MF **A01**
AiResearch Mfg. Co. of Arizona, Phoenix.
Pollution Reduction Technology Program Small Jet Aircraft Engines, Phase 3.
Final Report.
T. W. Bruce, F. G. Davis, T. E. Kuhn, and H. C. Mongia. Dec 81, 180p NASA-CR-165386, AIRESEARCH-21-3615
Contract NAS3-20819

A series of Model TFE731-2 engine tests were conducted with the Concept 2 variable geometry airblast fuel injector combustion system installed. The engine was tested to: (1) establish the emission levels over the selected points which comprise the Environmental Protection Agency Landing-Takeoff Cycle; (2) determine engine performance with the combustion system; and (3) evaulate the engine acceleration/deceleration characteristics. The hydrocarbon (HC), carbon monoxide (CO), and smoke goals were met. Oxides of nitrogen (NOx) were above the goal for the same configuration that met the other pollutant goals. The engine and combustor performance, as well as acceleration/deceleration characteristics, were acceptable. The Concept 3 staged combustor system was refined from earlier phase development and subjected to further rig refinement testing. The concept met all of the emissions goals.

N82-14096/3 PC **A03**/MF **A01**
AiResearch Mfg. Co. of Arizona, Phoenix.
Erbs Fuel Addendum: Pollution Reduction Technology Program Small Jet Aircraft Engines, Phase 3.
Final Report.
T. W. Bruce, F. G. Davis, T. E. Kuhn, and H. C. Mongia. 1982, 47p NASA-CR-165387, AIRESEARCH-21-3619
Contract NAS3-20819

A Model TFE731-2 engine with a low emission, variable geometry combustion system was tested to compare the effects of operating the engine on Commercial Jet-A aviation turbine fuel and experimental referee broad specification (ERBS) fuels. Low power emission levels were essentially identical while the high power NOx emission indexes were approximately 15% lower with the EBRS fuel. The exhaust smoke number was approximately 50% higher with ERBS at the takeoff thrust setting; however, both values were still below the EPA limit of 40 for the Model TFE731 engine. Primary zone liner wall temperature ran an average of 25 K higher with ERBS fuel than with Jet-A. The possible adoption of broadened proprties fuels for gas turbine applications is suggested.

N82-14472/6 PC **A07**/MF **A01**
Technische Univ., Berlin (Germany, F.R.).
Experimental Investigation of the Influence of the Casing Geometry Upon the Flow Conditions and the Noise of a Centrifugal Fan.
Ph.D. Thesis.
T. Gikadi. 1981, 136p DFVLR-FB-81-20
Text in German. Prepared in Cooperation with Dfvlr, Berlin.

Beginning with a casingless impeller with six backward curved blades, the influence of a small logarithmic volute casing with a cutoff clearance of delta/R = 0,014 (R = impeller radius) upon the flow through the rotating impeller ducts is studied. There was a blockage of the flow in each impeller duct when passing the cutoff, due to the small cutoff clearance. An optimization of the casing geometry regarding low noise and high fan efficiency leads to a logarithmic spiral with a large cutoff clearance of detla/R = 0,3. The noise is reduced by 22 dB (A) without loss in fan efficiency.

N82-14531/9 PC **A10**/MF **A01**
Arizona Univ., Tucson. Dept. of Aerospace and Mechanical Engineering.
The Application of Probabilistic Design Theory to High Temperature Low Cycle Fatigue.
P. H. Wirsching. Nov 81, 224p NASA-CR-165488
Contract NAG3-41

Metal fatigue under stress and thermal cycling is a principal mode of failure in gas turbine engine hot section components such as turbine blades and disks and combustor liners. Designing for fatigue is subject to considerable uncertainty, e.g., scatter in cycles to failure, available fatigue test data and operating environment data, uncertainties in the models used to predict stresses, etc. Methods of analyzing fatigue test data for probabilistic design purposes are summarized. The general strain life as well as homo- and hetero-scedastic models are considered. Modern probabilistic design theory is reviewed and examples are presented which illustrate application to reliability analysis of gas turbine engine components.

N82-14849/5 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Application of Integration Algorithms in a Parallel Processing Environment for the Simulation of Jet Engines.
S. M. Krosel, and E. J. Milner. 1982, 25p NASA-TM-82746, E-1059
To Be Presented at the 15TH Ann. Simulation Symp., Tampa, Fla., 17-19 Mar. 1982.

The application of Predictor corrector integration algorithms developed for the digital parallel processing environment are investigated. The algorithms are implemented and evaluated through the use of a software simulator which provides an approximate representation of the parallel processing hardware. Test cases which focus on the use of the algorithms are presented and a specific application using a linear model of a turbofan engine is considered. Results are presented showing the effects of integration step size and the number of processors on simulation accuracy. Real time performance, interprocessor communication, and algorithm startup are also discussed.

21H. Rocket Motors and Engines

N82-14280/3 PC **A04**/MF **A01**
Lockheed Missiles and Space Co., Huntsville, AL. Huntsville Research and Engineering Center.
Parametric Analysis of Diffuser Requirements for High Expansion Ratio Space Engine.
Final Report.
C. J. Wojciechowski, and P. G. Anderson. Nov 81, 65p NASA-CR-161924, LMSC-HREC-TR-D784489
Contract NAS8-33981

A supersonic diffuser ejector design computer program was developed. Using empirically modified one dimensional flow methods the diffuser ejector geometry is specified by the code. The design code results for calculations up to the end of the diffuser second throat were verified. Diffuser requirements for sea level testing of high expansion ratio space engines were defined. The feasibility of an ejector system using two commonly available turbojet engines feeding two variable area ratio ejectors was demonstrated.

21I. Rocket Propellants

AD-A108 769/1 PC **A03**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
Parametric Study of Propellant Crack Combustion.
Final rept. for FY1979,
Kibong Kim. 21 Oct 81, 37p Rept no. NSWC/TR-79-485

Selective calculations have been made for burning in cracks as it pertains to solid rocket motor propellants. The possibility of obtaining pressures high enough to cause a shock-to-detonation transition (sdt) in propellant grains is examined. variables affecting the crack combustion process which were selected for study are: crack shape; location; surface roughness; propellant deformation; ignition criterion; and burning rate. The variables are evaluated and ordered in groups of relative importance. results suggest that SDT should not occur in propellants unless the granulation of the grain is severe enough to provide large burning surface area. (Author)

22.

SPACE TECHNOLOGY

22A. Astronautics

AD-A109 272/5 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Ranging and Synchronization between Nominally Co-Orbital Satellites.
Interim rept.,
J. W. Schwartz. 24 Dec 81, 16p Rept no. NRL-8532

A link between two satellites can provide direct measurements of clock synchronism and intersatellite range that are more accurate than estimates obtainable from ground measurements. Moreover these direct measurements can be made continuously with near-zero delays. Two approaches to ranging and synchronization between satellite pairs are 'balanced' systems in which each satellite makes a time-difference measurement, and 'full loop' systems in which a time-difference measurement is made on only one satellite. This report discusses factors which determine the ultimate limitations and capabilities of both approaches, and compares the schemes for applications in which two digital clocks are actually brought into synchronism with accuracies of several nanoseconds. (Author)

N82-14106/0 PC **A07**/MF **A01**
Texas Southern Univ., Houston.
Introduction to Orbital Flight Planning (1).
H. E. Blackwell, E. L. Davis, and D. D. Dell. 31 Aug 81, 140p NASA-CR-165052
Contract NAG9-6

This workbook is designed for students interested in space flight planning, who after training, may serve as flight planning aides. Routine flight planning activities requiring engineering-type calculations and analysis are covered. Practice exercises and brief instructions are given for the programming and use of the hand calculator as well as the calculation of position and velocity in the orbital plane. Calculation of relative orbital position is also covered with emphasis upon celestial coordinates and time measurement.

N82-14204/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Mission Operation Report: Voyager Mission Success Assessment.
1981, 6p NASA-TM-84062, S-802-77-01/02

A favorable assessment of the Voyager Mission is based upon: (1) scientific investigations performed at seven of the major bodies of the solar system; (2) comparative studies of the Jupiter and Saturn systems, including their satellites, rings, and fields and particles environments; (3) measurements of the characteristics of the interplanetary medium from Earth to Saturn; and (4) fulfillment of the Mission Success Criteria. Fifteen mission achievements are listed. Publication of results is mentioned. The status of voyager spacecrafts 1 and 2 is reviewed. A list of ten awards is included.

22B. Spacecraft

AD-A108 910/1 PC **A10**/MF **A01**
Charles Stark Draper Lab., Inc., Cambridge, MA.
ACOSS Six (Active Control of Space Structures).
Final technical rept. 14 Feb 80-13 Feb 81,
Robert Strunce, Jiguan G. Lin, Daniel R. Hegg, Eli Fogel, and James D. Turner. Oct 81, 206p R-1454, RADC-TR-81-289
Contract F30602-80-C-0096, ARPA Order-3654

The research documented in this report addresses several major technical issues in vibration controller design methodologies that are of fundamental importance to control of large flexible space structures. Fundamentally important analytical and numerical results, as well as useful new insights, have been obtained on: optimality of fixed-form reduced-order compensators; full-order closed-loop stability and robustness with reduced-order controllers; prevention of control and observation spillover; active augmentation of damping, stiffness, and stability, stabilizability by output feedback control; large-angle maneuver with simultaneous vibration suppression; and possibilities for improving current controller design methodologies.

AD-A109 042/2 PC **A02**/MF **A01**
Arnold Engineering Development Center, Arnold AFS, TN.
Hypervelocity Track Tests of the NASA Galileo Probe Heatshield.
Final rept.,
A. M. Adams. Dec 80, 19p Rept no. AEDC-TSR-80-V60
Prepared in cooperation with ARO, Inc., Tullahoma, TN.

Tests were conducted in a hypervelocity track facility to establish the ablative characteristics of the heatshield material for the NASA/Ames Galileo Probe. Data were obtained from eight shots at launch velocities ranging from 15,850 fps to 17,950 fps. Six of the shots were conducted through an argon environment. The test required the nosetip to be recovered intact. Measurements were made of the model velocity and in-flight surface temperature. A description of the test unit, test article, and test technique is presented herein. (Author)

N82-14203/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
System Analysis Approach to Deriving Design Criteria (Loads) for Space Shuttle and Its Payloads. Volume 1: General Statement of Approach.
R. S. Ryan, T. Bullock, W. B. Holland, D. A. Kross, and L. A. Kiefling. Dec 81, 47p NASA-TP-1949, M-358

Space shuttle, the most complex transportation system designed to date, illustrates the requirement for an analysis approach that considers all major disciplines simultaneously. Its unique cross coupling and high sensitivity to aerodynamic uncertainties and high performance requirements dictated a less conservative approach than those taken in programs. Analyses performed for the space shuttle and certain payloads, Space Telescope and Spacelab, are used a examples. These illustrate the requirements for system analysis approaches and criteria, including dynamic modeling requirements, test requirements control requirements and the resulting design verification approaches. A survey of the problem, potential approaches available as solutions, implications for future systems, and projected technology development areas are addressed.

N82-14205/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
POMS, Polar Meteorological Satellite: A Contribution for Global Radiation Budget Measurement.
J. Puls. Nov 81, 29p NASA-TM-76642
Contract NASW-3542
Transl. Into English from Z. Fuer Flugwillenschaften und Weltraumforschung (Germany, F.R.). V. 5, No. 2, p 94-103. Original Language Document Was Announced as A81-35787. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Dfvlr, Oberpfaffenhofen, West Germany.

A proposal for a climate research mission specialized to Earth radiation budget measurements is given. This mission requires daily global coverage established by a system of three orbiting satellites. One of them is represented by the European Space Agency satellite SEOCS that is on a drifting orbit with respect to the Sun with 57 degrees inclination. The two others are polar orbiting satellites (POMS). The mission concept is treated with reference to the payload side requirements, the choice of orbit, orbital analysis, and satellite requirements.

N82-14209/2 PC **A06**/MF **A01**
Martin Marietta Aerospace, Denver, CO. Denver Div.
Space Tug Systems Study (Storable). Volume 1: Overview Presentation.
Final Report.
Jan 74, 111p NASA-CR-161919, MCR-73-314-V-1-1
Contract NAS8-29675

Program plans are established for a storable propellant space tug used to perform high energy orbit transfers from the space transportation system (STS) orbiter. The mission model for the STS in the 1980's is analyzed. Performance and mission requirements are determined. Various flight operations modes are evaluated and selected. Subsystems are selected and synthesized into various tug configurations. Program options for these configurations are defined, analyzed, and selected. Selected program options are further defined and optimized, including program requirements, tug vehicle definition, mission accomplishment, ground and flight operations, programmatics and costs.

N82-14210/0 PC **A14**/MF **A01**
Martin Marietta Aerospace, Denver, CO. Denver Div.
Space Tug Systems Study. Volume 2: Compendium.
Final Report.
Jan 74, 318p NASA-CR-161920, MCR-73-314-V-2-2
Contract NAS8-29675

Possible storable propellant configurations and program plans are evaluated for the space tug. Alternatives examined include: use of existing expendable stages modified for use with shuttle, followed by a space tug at a later date; use of a modified growth version of existing expendable stages for greater performance and potential reuse, followed by a space tug at a later date; use of a low development cost, reusable, interim space tug available at shuttle initial operational capability (IOC) that could be evolved to greater system capabilities at a later date; and use a direct developed tug with maximum potential to be available at some specified time after space shuttle IOC. The capability options were narrowed down to three final options for detailed program definition.

N82-14211/8 PC **A03**/MF **A01**
Martin Marietta Aerospace, Denver, CO. Denver Div.
Space Tug Systems Study (Storable). Volume 3: Executive Summary.
Final Report.
Jan 74, 37p NASA-CR-161918, MCR-73-314-V-3-3
Contract NAS8-29675

Space tug program options that consider key issues and mission requirements are assessed, component and subsystem candidates are evaluated, and tug configurations synthesized. Three tug program options are defined and evaluated.

N82-14213/4 PC **A99**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Spacecraft Charging Technology, 1980.
Oct 81, 1005p NASA-CP-2182, AFGL-TR-81-0270
Conf. Held in Colorado Springs, 12-14 Nov. 1980; Sponsored by Afgl and NASA Lewis Research Center.

No abstract available.

N82-14276/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Interactive Design and Analysis of Future Large Spacecraft Concepts.
L. B. Garrett. Dec 81, 32p NASA-TP-1937, L-14739
Presented at the 16TH Aiaa Thermophys. Conf., Palo Alto, Calif., 23-25 Jun. 1981.

An interactive computer aided design program used to perform systems level design and analysis of large spacecraft concepts is presented. Emphasis is on rapid design, analysis of integrated spacecraft, and automatic spacecraft modeling for lattice structures. Capabilities and performance of multidiscipline applications modules, the executive and data management software, and grahics display features are reviewed. A single user at an interactive terminal create, design, analyze, and conduct parametric studies of Earth orbiting spacecraft with relative ease. Data generated in the design, analysis, and performance evaluation of an Earth-orbiting large diameter antenna satellite are used to illustrate current capabilities. Computer run time statistics for the individual modules quantify the speed at which modeling, analysis, and design evaluation of integrated spacecraft concepts is accomplished in a user interactive computing environment.

N82-14277/9 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Thermal and Aerothermal Performance of a Titanium Multiwall Thermal Protection System.
D. E. Avery, J. L. Shideler, and R. N. Stuckey. Dec 81, 59p NASA-TP-1961, L-14719

A metallic thermal protection system (TPS) concept the multiwall designed for temperature and pressure at Shuttle body point 3140 where the maximum surface temperature is approximately 811 K was tested to evaluate thermal performance and structural integrity. A two tile model of titanium multiwall and a model consisting of a low temperature reusable surface insulation (LRSI) tiles were exposed to 25 simulated thermal and pressure Shuttle entry missions. The two systems performed the same, and neither system deteriorated during the tests. It is indicated that redesign of the multiwall tiles reduces tile thickness and/or weight. A nine tile model of titanium multiwal was tested for radiant heating and aerothermodynamics. Minor design changes that improve structural integrity without having a significant impact on the thermal protection ability of the titanium multiwall TPS are identified. The capability of a titanium multiwall thermal protection system to protect an aluminum surface during a Shuttle type entry trajectory at locations on the vehicle where the maximum surface temperature is below 811 K is demonstrated.

N82-14615/0 PC **A10**/MF **A01**
ERNO Raumfahrttechnik G.m.b.H., Bremen (Germany, F.R.).
Study of a Combined Satellite System for Remote Sensing and Earth-Oriented Research (LOCSS).
Final Report, Jul. 1980.
H. Guenther, W. Gericke, H. Klotz, R. Krieger, and B. Metzgar. Jan 81, 222p BMFT-FB-W-81-002, ISSN-0170-1339
In German; English Summary. Sponsored by Bundesministerium fuer Forschung und Technologie.

The suitability of three European satellite platforms (ERDSAT, SPAS, SPOT) for a combined satellite system (remote sensing and Earth-oriented research) is discussed. The system consists of two Sun-synchronous orbiting satellites with a combined remote sensing and Earth-oriented research payload and of a pure climatography satellite on a drift orbit. All platforms can accommodate the basic payload, but SPAS offers some advantages and is the only platform able to accommodate the extended payload. The combined three-satellite system offers cost advantages over the four-satellite system only if the space shuttle is used as launcher. Hence, SPAS should be given preference over the other platforms for such a system. The subsystem design is presented and problem areas are discussed. Data acquisition and data processing of image and climatic data are the bottlenecks in existing systems.

22C. Spacecraft Trajectories and Reentry

AD-A109 363/2 PC **A04**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Table of Space Vehicles, 1958-1980.
Technical rept.,
H. Hiller, and J. A. Pilkington. Jul 81, 52p RAE-TR-81095, DRIC-BR-81084

Details of all satellites launched into orbit about the Earth have been published in The RAE Table of Earth Satellites, 1957-1980 (Macmillan Press, 1981). The

present report offers a similar listing, though in a different format, of all space vehicles that escaped from the Earth's influence as a result of the 109 space launchings during the years 1958-1980. Whenever possible, the following details are given for each component: name, international designation, date of launch, mass, basic shape and size, details of orbit or trajectory, and, where appropriate, the time and place or impact or landing on the Moon or a planet. The table is in six sections: (A) orbits around the Sun; (B) in the Earth-Moon system; (C) and (D) around the Moon; (E) around Mars; and (F) around Venus. (Author)

N82-14123/5 PC **A22**/MF **A01**
European Space Agency, Paris (France).
Spacecraft Flight Dynamics.
T. D. Guyenne, and G. Levy. Aug 81, 503p ESA-SP-160, ISSN-039-6566
Partly in English and French. Proceedings of Intern. Symp., Darmstadt, West Germany, 18-22 May 1981.

No abstract available.

N82-14278/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Attitude Measurement: Principles and Sensors.
P. Duchon, and M. P. Vermande. Nov 81, 47p NASA-TM-76647
Contract NASW-3541
Transl. Into English of "La Mesure d'Attitude, les Principes - les Sensors" France, 1980 p 315-348. Original Language Document Was Announced as A81-33388. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Cnes, France. Presented at Spacecraft Orbital Motion; Course in Space Technol., Toulouse, 2-13 Jun. 1980.

Tools used in the measurement of satellite attitude are described. Attention is given to the elements that characterize an attitude sensor, the references employed (stars, moon, Sun, Earth, magnetic fields, etc.), and the detectors (optical, magnetic, and inertial). Several examples of attitude sensors are described, including sun sensors, star sensors, earth sensors, triaxial magnetometers, and gyrometers. Finally, sensor combinations that make it possible to determine a complete attitude are considered; the SPOT attitude measurement system and a combined CCD star sensor-gyrometer system are discussed.

22D. Spacecraft Launch Vehicles and Ground Support

AD-A109 279/0 PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Millstone Hill Radar Satellite Tracking System.
Project rept.,
Eli M. Hauser. 4 Nov 81, 65p STK-114, ESD-TR-81-298
Contract F19628-80-C-0002

This document describes the hardware utilized at the Lincoln Laboratory Millstone radar facility. A system overview is presented which explains the function each subsystem fulfills and its interaction with the system. A detailed analysis of each subsystem follows. Diagrams for each level of consideration are included. This document is current as of 1 September 1981. (Author)

AD-A109 389/7 PC **A08**/MF **A01**
TRW Defense and Space Systems Group, Albuquerque, NM.
SXTF Facility Design and Development Support.
Final rept. 1 Jan 80-27 Feb 81,
E. P. Chivington, H. N. Hodges, and J. T. Nolan. 28 May 81, 155p TRW-34670-6009-UT-00, DNA-5642F
Contract DNA001-79-C-0134

This document summarizes the effort over the reporting period. The results of site surveys of NASA Houston and Arnold Engineering Development Center are summarized. A study of the possibility of including additional weapons effects testing in the SXTF design is included. A facility-user interface requirements document has been developed and is included. It specifies all of the support required by a satellite manufacturer in order to perform X-ray testing. (Author)

N82-14279/5 PC **A07**/MF **A01**
Centre de Recherches en Physique de l'Environnement Terrestre et Planetaire, Orleans (France).
Ricar: Portable Test Equipment for the Integration of the Isoprobre Experiment on Board the Arcad 3 Satellite Ricar: Reference pour Interface Coupleur Arcad. Appareil de Test Portable pour l'Integration de l'Experience Isoprobe a Bord du Satellite Arcad 3.
J. P. Dume, M. Leveque, and P. Fort. 10 Jun 81, 147p CRPE-1078
Text in French.

Test equipment that substitutes for an onboard computer which operates a satellite sounding experiment was developed. Computer system functions are described and circuit diagrams are given. The test system performs two operations: it verifies experiment modules, localizing defects and it sends repetitive command sequences, detecting malfunctions which might be due to the satellite/experiment interface. Checkout procedures for satellite support and maintenance personnel are recommended.

KEYWORD INDEX

NTIS®

Index entries in this section are selected to indicate important ideas and concepts presented in a report. When using the keyword index, be sure to look under terms narrower, broader, or related to a particular topic. Although some of the keywords are not selected from a controlled vocabulary of terms, most of them have been selected from the DoD, DoE, NASA, or NTIS controlled vocabularies. The entries are arranged by keyword and then by the NTIS order number.

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FAST FOURIER TRANSFORMATIONS
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm.
PB80-104045 33

Keyword term
Title
NTIS order number Page number

ABBREVIATIONS
A Glossary of Range Terminology.
AD-A108 894/7 1786

ABLATION
Performance Technology Program (PTP-S II). Volume III. Inviscid Aerodynamic Predictions for Ballistic Reentry Vehicles with Ablated Nosetips.
AD-A108 845/9 1786

Performance Technology Program (PTP-S II). Volume X. Material Characterization of Post-Test Ablation Models.
AD-A108 849/1 1787

Laser Tool: Pulsed Solid State Laser for Welding and Ablation of Material.
N82-14518/6 1776

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PATENT-4 300 723 1778

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Nonlinear Absorption Due to Shallow Donors in Germanium at 10.6 Micrometers.
AD-A109 075/2 1833

ABSORPTION SPECTRA
The Discovery of 50 Minute Periodic Absorption Events from 4U1915-05.
N82-15001/2 1664

The 3.4 Micron Interstellar Absorption Feature and the Organic Composition of Interstellar Grains.
N82-15002/0 1664

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AD-A108 791/5 1692

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Child Advocacy, Abuse, and Neglect. Procedures Manual.
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SHR-0008285 1686

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Progress Report, Physics Division, 1 October - 31 December, 1979.
AECL-6788 1806

Progress Report, Physics Division, 1 January - 31 March, 1980.
AECL-6956 1806

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Harwell 80/500 KeV Dual Beam Facility.
AERE-M-3138 1806

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CEA-CONF-5290 1806

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IFVE-OUNK/ORI-80-17 1807

ACCIDENT INVESTIGATIONS
Marine Accident Report: Grounding of the U.S. Sailboat MR. B Near Punta Chivata, Mexico, November 25, 1981.
PB82-148495 1777

The GAUL Disaster: An Investigation into the Loss of a Large Stern Trawler,
PB82-151366 1777

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PB82-147489 1768

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AD-A109 018/2 1717

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N82-14438/7 1791

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Urinary Metabolites from Controlled Exposures of Humans to Trichloroethylene,
PB82-151713 1712

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In-Depth Industrial Hygiene Survey Report on Styrene Exposure at Tollycraft, Kelso, Washington.
PB82-150954 1703

In-Depth Industrial Hygiene Survey Report on Styrene Exposure at Uniflite, Inc., Bellingham, Washington.
PB82-162553 1706

ACETYCHOLINE
Differentiation of the Open and Closed States of the Ionic Channels of Nicotinic Acetylcholine Receptors by Tricyclic Antidepressants.
AD-A109 252/7 1688

ACETYLCHOLINE
The Acetylcholine Receptor and Its Ionic Channel as Targets for Drugs and Toxins.
AD-A109 150/3 1688

Nature of Regional and Chemically-Induced Differences in the Binding Properties of Muscarinic Acetylcholine Receptors from Rat Brain.
AD-A109 231/1 1688

A New Mechanism Revealed for the Action of Antibodies on Acetylcholine Receptor Function.
AD-A109 233/7 1688

The Ionic Channel of the Acetylcholine Receptor: Regulation by Sites Outside and Inside the Cell Membrane Which are Sensitive to Quaternary Ligands.
AD-A109 240/2 1709

Coupling between the Nicotinic Acetylcholine Receptor Site and the Ionic Channel Site.
AD-A109 241/0 1709

Activation, Inactivation, and Desensitization of Acetylcholine Receptor Channel Complex Detected by Binding of Perhydrohistrionicotoxin.
AD-A109 423/4 1688

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Ground States of Molecules. 58. The C4H4 Potential Surface.
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AD-A109 273/3 1787

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AD-A109 420/0 1802

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PB82-152661 1783

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PB82-155045 1783

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Thermal and Aerothermal Performance of a Titanium Multiwall Thermal Protection System.
N82-14277/9 1838

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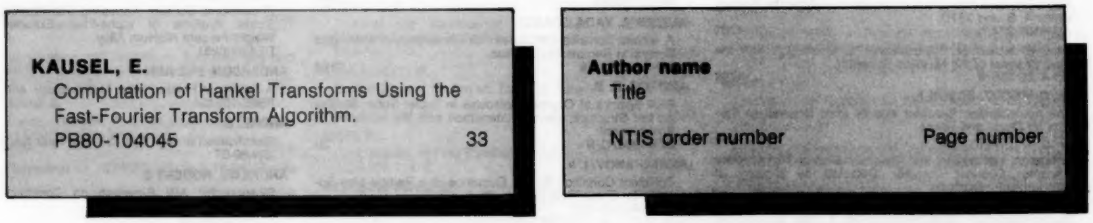

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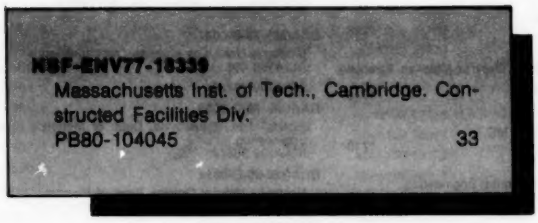

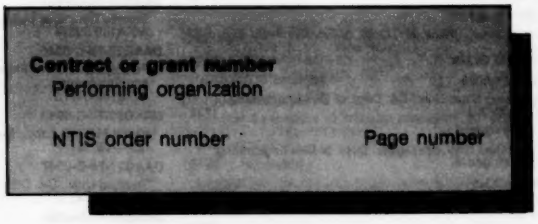

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AD-A108 832/7 1735

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Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
AD-A108 853/3 1733
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AD-A109 396/2 1738

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AD-A108 797/2 1741
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Emmanuel Coll., Boston, MA. Physics Research Div.
AD-A109 063/8 1665

F19628-82-C-0001
MITRE Corp., Bedford, MA.
AD-A108 798/0 1668

F30602-78-C-0120
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
AD-A108 974/7 1735

F30602-79-C-0011
Syracuse Univ., NY. Dept. of Electrical and Computer Engineering.
AD-A108 780/8 1733

F30602-79-C-0091
Worcester Polytechnic Inst., MA. Dept. of Electrical Engineering.
AD-A108 763/4 1740

F30602-80-C-0068
IBM Federal Systems Div., Manassas, VA.
AD-A108 766/7 1732

F30602-80-C-0082
General Electric Co., Daytona Beach, FL.
AD-A108 792/3 1734
AD-A108 793/1 1734

F30602-80-C-0096
Charles Stark Draper Lab., Inc., Cambridge, MA.
AD-A108 910/1 1838

F30602-80-C-0099
Measurement Concept Corp., Rome, NY..
AD-A108 794/9 1734

F30602-80-C-0163
Goodyear Aerospace Corp., Akron, OH.
AD-A108 767/5 1734

F33600-79-C-0540
TRW Defense and Space Systems Group, Redondo Beach, CA.
AD-A109 380/6 1785
AD-A109 381/4 1785

F33615-77-C-0055
Singer Co., Binghamton, NY. Link Div.
AD-A109 127/1 1711

F33615-78-C-1551
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
AD-A109 026/5 1736

F33615-78-D-0617
Utah Univ., Salt Lake City. Dept. of Bioengineering.
AD-A108 938/2 1700

F33615-80-D-4001
Fish and Wildlife Service, Oracle, AZ. Inst. for Raptor Studies.
AD-A108 778/2 1700

F49620-77-C-0022
California Inst. of Tech., Pasadena. Seismological Lab.
AD-A109 016/6 1732

F49620-77-C-0028
Honeywell Corporate Technology Center, Bloomington, MN.
AD-A109 070/3 1833

F49620-77-C-0124
Systems Research Labs., Inc., Dayton, OH. Research Applications Div.
AD-A109 087/7 1745

F49620-79-C-0057
Boeing Aerospace Co., Seattle, WA.
AD-A108 975/4 1832

F49620-79-C-0099
SRI International, Menlo Park, CA.
AD-A108 979/6 1736

F49620-79-C-0124
Colorado State Univ., Fort Collins. Dept. of Mathematics.
AD-A109 126/3 1752

F49620-79-C-0143
Carnegie-Mellon Univ., Pittsburgh, PA.
AD-A109 076/0 1736

F49620-79-C-0179
Klein Associates, Yellow Springs, OH.
AD-A109 326/9 1680

F49620-79-C-0187
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
AD-A109 014/1 1717
AD-A109 018/2 1717
AD-A109 065/3 1717

F49620-80-C-0008
Massachusetts Inst. of Tech., Cambridge. Dept. of Physics.
AD-A109 075/2 1833

F49620-80-C-0086
Ohio State Univ. Research Foundation, Columbus.
AD-A109 088/5 1712

F49620-81-C-0008
California Inst. of Tech., Pasadena. Seismological Lab.
AD-A109 016/6 1732

F49620-81-C-0039
Interactive Systems Corp., Littleton, CO.
AD-A108 976/2 1736

FA-80016
ACT Foundation, Basking Ridge, NJ.
PB82-156191 1779

FA-80025
Battelle Law and Justice Study Center, Seattle, WA.
PB82-137878 1681

FDA-223-74-5253
Utah Biomedical Test Lab., Salt Lake City.
PB82-153818 1699
PB82-154543 1707
PB82-154550 1699
PB82-154568 1699

FDA-223-78-2100
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
PB82-155466 1702
PB82-155474 1702
PB82-155482 1702

FDA-223-79-2275
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
PB82-153404 1701

FG03-80SF11442
San Bernardino Municipal Water Dept., CA.
DE81030968 1754

H0292014
Ko (Kenneth C.) and Associates, Inc., Denver, CO.
PB82-149352 1731

H0292016
Southwest Research Inst., San Antonio, TX.
PB82-143165 1730

H0292026
Hamilton Engineering, Inc., Seattle, WA.
PB82-146267 1730

J-9-F-5-0147
Stanford Research Inst., Menlo Park, CA.
PB82-152836 1706

J0100040
Brown (Dayton T.), Inc., Bohemia, NY. Engineering and Test Div.
PB82-146325 1730

J0199125
Michigan Technological Univ., Houghton.
PB82-148388 1768

J0265055
Minnesota Univ., Minneapolis.
PB82-143173 1767

J0275040
Colorado School of Mines Research Inst., Golden.
PB82-138264 1730
PB82-138272 1730

J0285029
Berger (Philip R) and Associates, Inc., Bradfordwoods, PA.
PB82-152125 1729
PB82-152133 1729

JPL-955591
Toronto Univ. (Ontario). Dept. of Chemistry.
N82-14357/9 1725
N82-14358/7 1725

JPL-955688
Ross (Bernd) Associates, San Diego, CA.
N82-14629/1 1743
N82-14630/9 1743

JPL-956061
Solarelectronics, Inc., Bellingham, MA.
N82-14631/7 1743

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Battelle Law and Justice Study Center, Washington, DC.
PB82-140682 1681

MDA903-76-C-0260
System Development Corp., Santa Monica, CA.
AD-A109 316/0 1737
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MDA903-78-C-0189
RAND Corp., Santa Monica, CA.
AD-A108 935/8 1806

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WICAT, Inc., Orem, UT.
AD-A109 197/4 1676

MDA903-79-C-0326
Litton Mellonics Systems Development Div., Arlington, VA.
AD-A109 198/2 1676

MDA903-79-C-0558
International Public Policy Research Corp., McLean, VA.
AD-A109 194/1 1676

MDA903-80-C-0107
Stanford Univ., CA. Dept. of Computer Science.
AD-A109 324/4 1738

MDA903-80-C-0185
Science Applications, Inc., McLean, VA.
AD-A109 202/2 1677

MDA903-80-C-0194
Decisions and Designs, Inc., McLean, VA.
AD-A109 130/5 1679

MDA903-80-C-0214
Bolt Beranek and Newman, Inc., Cambridge, MA.
AD-A108 783/2 1788

MDA903-80-C-0353
Bolt Beranek and Newman, Inc., Cambridge, MA.
AD-A108 783/2 1788

MDA903-80-C-0652
RAND Corp., Santa Monica, CA.
AD-A108 934/1 1676

MDA903-80-D-0668
CACI, Inc.-Federal, Arlington, VA.
AD-A109 135/4 1785

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Philips Labs., Briarcliff Manor, NY.
AD-A109 129/7 1804

MDA903-81-C-0332
Boeing Aerospace Co., Seattle, WA.
AD-A109 334/3 1738

MDA903-81-M-3057
Management Consulting and Research, Inc., Falls Church, VA.
AD-A109 414/3 1785

MIPR-49-0042
United States International Univ., San Diego, CA. Family Research Center.
AD-A108 936/6 1680

MIRP-79-0042
United States International Univ., San Diego, CA. Family Research Center.
AD-A108 937/4 1680

N01-AG-7-2118
National Research Council, Washington, DC.
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California Univ., San Francisco.
PB82-154360 1699

N01-HV-02929
Pittsburgh Univ., PA.
PB82-154238 1707

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Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.
AD-A109 388/9 1748

N00014-72-F-0042
National Bureau of Standards, Washington, DC.
PB82-149121 1749

N00014-75-C-0201
Florida State Univ., Tallahassee. Dept. of Oceanography.
AD-A109 397/0 1725

N00014-75-C-0305
Virginia Univ., Charlottesville. Dept. of Chemistry.
AD-A109 382/2 1718
AD-A109 384/8 1716

N00014-75-C-0455
Purdue Univ., Lafayette, IN. Dept. of Statistics.
AD-A109 283/2 1752
AD-A109 288/1 1753

N00014-75-C-0466
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.
AD-A109 388/9 1748

N00014-75-C-0543
Lehigh Univ., Bethlehem, PA. Inst. of Fracture and Solid Mechanics.
AD-A109 296/4 1747
AD-A109 297/2 1747
AD-A109 399/6 1748

N00014-75-C-0569
Texas Univ. at Austin. Center for Cybernetic Studies.
AD-A109 148/7 1669

N00014-75-C-0643
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
AD-A109 031/5 1736

N00014-75-C-0690
Washington Univ., Seattle. Dept. of Chemistry.
AD-A108 931/7 1717

N00014-75-C-0729
George Washington Univ., Washington, DC. Program in Logistics.
AD-A109 367/3 1669

N00014-75-C-0752
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
AD-A109 398/8 1738

N00014-75-C-0856
Catholic Univ. of America, Washington, DC. Vitreous State Lab.
AD-A108 822/8 1745

N00014-75-C-0922
Texas Univ. at Austin. Dept. of Chemistry.
AD-A109 383/0 1725

N00014-76-C-0025
California Univ., San Diego, La Jolla. Inst. of Geophysics and Planetary Physics.
AD-A108 886/3 1751

N00014-76-C-0034
Chicago Univ., IL. Dept. of Geophysical Sciences.
AD-A109 369/9 1729

N00014-76-C-0060
Washington Univ., Seattle. Dept. of Mechanical Engineering.
AD-A109 299/8 1750

N00014-76-C-0197
Woods Hole Oceanographic Institution, MA.
AD-A108 883/0 1727

N00014-77-C-0360
Tennessee Univ., Knoxville. Dept. of Psychology.
AD-A109 112/3 1752
AD-A109 141/2 1679
AD-A109 187/5 1752

N00014-77-C-0412
Stanford Univ., CA. Edward L. Ginzton Lab. of Physics.
AD-A109 271/7 1834

N00014-77-C-0516
Battelle Columbus Labs., OH.
AD-A109 321/0 1747

N00014-77-C-0576
Battelle Columbus Labs., OH.
AD-A109 322/8 1832
AD-A109 323/6 1748

N00014-77-C-0605
Vermont Univ., Burlington. Dept. of Chemistry.
AD-A108 782/4 1749

N00014-77-C-0656
National Bureau of Standards, Washington, DC.
PB82-149097 1721
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N00014-78-C-0044
Cornell Univ., Ithaca, NY. Dept. of Agronomy.
AD-A108 872/3 1700

N00014-78-C-0367
RCA Labs., Princeton, NJ.
AD-A108 777/4 1740

N00014-78-C-0433
Colorado Univ. at Boulder. Inst. of Cognitive Science.
AD-A109 179/2 1679
AD-A109 236/0 1677

N00014-78-C-0467
North Carolina Univ. at Chapel Hill. School of Business Administration.
AD-A109 295/6 1669

N00014-78-C-0562
State Univ. of New York at Buffalo. Dept. of Chemistry.
AD-A109 333/5 1716

N00014-78-C-0762
Delaware Univ., Newark. Dept. of Psychology.
AD-A108 907/7 1679
AD-A108 908/5 1679

N00014-79-C-0006
Colorado Univ. at Boulder. Dept. of Mechanical Engineering.
AD-A109 024/0 1803

N00014-79-C-0009
California Inst. of Tech., Pasadena. Arthur Amos Noyes Lab. of Chemical Physics.
AD-A108 858/2 1717

N00014-79-C-0078
North Carolina Univ. at Chapel Hill. School of Medicine.
AD-A109 339/2 1709

N00014-79-C-0253
Pennsylvania State Univ., University Park. Dept. of Microbiology.
AD-A108 873/1 1689

N00014-79-C-0323
California Univ., San Diego, La Jolla. Center for Human Information Processing.
AD-A108 928/3 1679
AD-A108 929/1 1735
AD-A108 930/9 1674

N00014-79-C-0342
Louisiana State Univ., Baton Rouge. Dept. of Civil Engineering.
AD-A108 759/2 1727

N00014-79-C-0418
Washington Univ., Seattle. Polar Science Center.
AD-A109 002/6 1732

N00014-79-C-0494
Southeastern Massachusetts Univ., North Dartmouth. Dept. of Electrical Engineering.
AD-A109 408/5 1738

N00014-79-C-0519
United States International Univ., San Diego, CA. Family Research Center.
AD-A108 936/6 1680
AD-A108 937/4 1680

N00014-79-C-0585
Edo Corp., College Point, NY. Government Products Div.
AD-A108 899/6 1787

N00014-79-C-0588
Yale Univ., New Haven, CT. Mason Lab.
AD-A109 118/0 1804
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N00014-79-C-0661
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
AD-A109 026/5 1736

N00014-79-C-0670
Michigan State Univ., East Lansing. Dept. of Chemistry.
AD-A109 051/3 1717

N00014-79-C-0700
EIC Labs., Inc., Newton, MA.
AD-A108 991/1 1717

N00014-79-C-0821
Battelle Memorial Inst., Columbus, OH.
AD-A109 410/1 1718

N00014-79-C-0873
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
AD-A108 817/8 1734
AD-A108 818/6 1734
AD-A108 819/4 1734
AD-A108 820/2 1735

N00014-79-C-0950
Stevens Inst. of Tech., Hoboken, NJ. Davidson Lab.
AD-A109 328/5 1777

N00014-80-C-0076
Florida State Univ., Tallahassee. Geophysical Fluid Dynamics Inst.
AD-A109 117/2 1727

N00014-80-C-0164
University of Southern California, Redondo Beach. Behavioral Technology Labs.
AD-A108 758/4 1675

N00014-80-C-0240
Williams Coll., Williamstown, MA. Dept. of Physics.
AD-A109 040/6 1717

N00014-80-C-0402
Educational Testing Service, Princeton, NJ.
AD-A108 874/9 1751
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AD-A108 882/2 1751

N00014-80-C-0472
Rochester Univ., NY. Dept. of Chemistry.
AD-A109 025/7 1717

N00014-80-C-0505
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
AD-A109 031/5 1736
AD-A109 032/3 1752

N00014-80-C-0538
Cornell Univ., Ithaca, NY. Dept. of Chemistry.
AD-A108 870/7 1833

N00014-80-C-0575
General Electric Co., Philadelphia, PA. Re-entry and Environmental Systems Div.
AD-A109 204/8 1745

N00014-80-C-0647
Harvard Univ., Cambridge, MA. Aiken Computation Lab.
AD-A108 823/6 1753
AD-A108 824/4 1735

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Harvard Univ., Cambridge, MA. Aiken Computation Lab.
AD-A108 825/1 1735
AD-A108 826/9 1751
AD-A109 034/9 1752
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AD-A109 046/3 1752
AD-A109 047/1 1736

N00014-80-C-0695
Edo Corp., College Point, NY. Government Products Div.
AD-A108 899/6 1787

N00014-80-C-0698
Analytical Technology Applications Corp., Sunnyvale, CA.
AD-A108 762/6 1740

N00014-80-C-0745
University of Southern California, Los Angeles. Electronic Sciences Lab.
AD-A108 888/9 1751

N00014-80-K-0360
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
AD-A109 293/1 1737
AD-A109 294/9 1737

N00014-80-K-0816
Purdue Univ., Lafayette, IN. Dept. of Computer Sciences.
AD-A109 293/1 1737
AD-A109 294/9 1737

N00014-81-C-0148
Sierra Geophysics, Inc., Arcadia, CA.
AD-A108 770/9 1732

N00014-81-C-0236
Texas Univ. at Austin. Center for Cybernetic Studies.
AD-A109 146/1 1676
AD-A109 147/9 1672
AD-A109 148/7 1669

N00014-81-C-0466
Decisions and Designs, Inc., McLean, VA.
AD-A109 030/7 1668

N00014-81-F-0008
National Bureau of Standards, Washington, DC. National Measurement Lab.

AD-A109 368/1 1718

N00014-81-K-0013
Massachusetts Inst. of Tech., Cambridge.
AD-A109 152/9 1747

N00014-81-K-0143
Virginia Polytechnic Inst. and State Univ., Blacksburg. Computer Science, Industrial Engineering and Operations Research.
AD-A109 280/8 1675
AD-A109 331/9 1674

N00014-81-K-0167
Baylor Coll. of Medicine, Houston, TX. Dept. of Physiology.
AD-A108 884/8 1688

N00014-81-K-0296
Catholic Univ. of America, Washington, DC. Vitreous State Lab.
AD-A108 822/8 1745

N00019-77-C-0032
Grumman Aerospace Corp., Bethpage, NY.
AD-A108 803/8 1784

N00019-79-C-0347
General Electric Corporate Research and Development, Schanectady, NY.
AD-A109 281/6 1750

N00019-79-C-0355
Vought Corp., Dallas, TX.
AD-A109 330/1 1659

N00019-80-C-0045
Michigan Univ., Ann Arbor. Electron Physics Lab.
AD-A109 305/3 1802

N00019-80-C-0265
Vought Corp. Advanced Technology Center, Dallas, TX.
AD-A109 282/4 1746

N00019-81-C-0093
Ohio State Univ., Columbus. ElectroScience Lab.
AD-A109 300/4 1790

N00039-78-G-0160
Alfred P. Sloan School of Management, Cambridge, MA.
AD-A109 134/7 1736

N00039-80-G-0132
Stanford Univ., CA. Dept. of Computer Science.
AD-A109 183/4 1737

N00123-80-D-0104
Integrated Sciences Corp., Santa Monica, CA.
AD-A109 270/9 1708

N00123-80-D-0591
Rehab Group, Inc., Falls Church, VA.
AD-A109 021/6 1679

N00140-81-Q-MM54
Southeastern Massachusetts Univ., North Dartmouth. Dept. of Electrical Engineering.
AD-A109 008/3 1740

N00173-80-C-0144
SRI International, Menlo Park, CA.
AD-A109 375/6 1777

N00173-80-C-0439
Hughes Research Labs., Malibu, CA.
AD-A108 764/2 1805

N61339-78-C-0060
Canyon Research Group, Inc., Westlake Village, CA.
AD-A108 801/2 1657

NA79AA-D-CZ101
Delaware Univ., Newark. Coll. of Marine Studies.
PB82-152158 1769

NA79AA-D-00049
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
PB82-153826 1770

NA79AA-D-00093
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
PB82-146283 1689

NA79AA-D-00101
Massachusetts Inst. of Tech., Cambridge. Sea Grant Coll. Program.
PB82-151382 1775

NA79AA-D-00118
Delaware Univ., Newark. Coll. of Marine Studies.
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NA79AA-D-11010
Massachusetts Inst. of Tech., Cambridge. Sea Grant Coll. Program.
PB82-147505 1732

NA80AA-D-00017
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
PB82-153834 1770
PB82-153867 1713
PB82-153891 1771

NA80AA-D-0077
Woods Hole Oceanographic Institution, MA.
PB82-153875 1690

NA80AA-D-00120
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
PB82-151945 1671

NA81FA-C-00018
Woods Hole Oceanographic Institution, MA.
PB82-153875 1690

NAG1-70
Duke Univ., Durham, NC. Dept. of Computer Sciences.
N82-14806/5 1660

NAG3-41
Arizona Univ., Tucson. Dept. of Aerospace and Mechanical Engineering.
N82-14531/9 1837

NAG9-6
Texas Southern Univ., Houston.
N82-14106/0 1837

NAS1-15644
Boeing Aerospace Co., Seattle, WA.
N82-14286/0 1746

NAS1-15646
Rohr Industries, Inc., Chula Vista, CA.
N82-14530/1 1775

NAS1-15977
Flow Research Co., Kent, WA.
N82-14529/3 1660

NAS1-16237
Cambridge Hydrodynamics, Inc., MA.
N82-14473/4 1804

NAS1-16365
Aeronautical Research Associates of Princeton, Inc., NJ.
N82-14878/4 1833

NAS3-20070
General Electric Co., Cincinnati, OH. Aircraft Engine Business Group.
N82-14092/2 1836
N82-14093/0 1836

NAS3-20819
AiResearch Mfg. Co. of Arizona, Phoenix.
N82-14095/5 1837
N82-14096/3 1837

NAS3-21051
Virginia Polytechnic Inst. and State Univ., Blacksburg.
N82-14447/8 1739

NAS3-21951
General Dynamics/Convair, San Diego, CA.
N82-14636/6 1744
N82-14637/4 1744

NAS3-22371
Avco Lycoming Engine Group, Stratford, CT. Materials Lab.
N82-14333/0 1746

NAS8-29675
Martin Marietta Aerospace, Denver, CO. Denver Div.
N82-14209/2 1838
N82-14210/0 1838
N82-14211/8 1838

NAS8-30777
McDonnell Douglas Astronautics Co.-St. Louis, MO.
N82-14444/5 1733

NAS8-32689
Texas Univ. at Dallas, Richardson. Center for Space Sciences.
N82-14212/6 1782

NAS8-33148
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
PB82-143363 1666

NAS8-33245
Honeywell Electro-Optics Operations, Lexington, MA.
N82-14308/2 1834

NAS8-33981
Lockheed Missiles and Space Co., Huntsville, AL. Huntsville Research and Engineering Center.
N82-14280/3 1837

NAS8-34026
Lockheed Missiles and Space Co., Inc., Sunnyvale, CA.
N82-14281/1 1835

NAS9-14880
Technology, Inc., Houston, TX. Life Sciences Div.
N82-14819/8 1738

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National Bureau of Standards, Washington, DC.
PB82-152737 1834

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Low Energy Transport Systems, Capistrano Beach, CA.
N82-14059/1 1656

NASW-3198
National Aeronautics and Space Administration, Washington, DC.
N82-14307/4 1733
N82-14332/2 1745

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N82-14310/8 1716
N82-14674/7 1767
N82-14693/7 1767
N82-14794/3 1712

NASW-3541
National Aeronautics and Space Administration, Washington, DC.
N82-14057/5 1656
N82-14278/7 1839
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NASW-3542
National Aeronautics and Space Administration, Washington, DC.
N82-14205/0 1838
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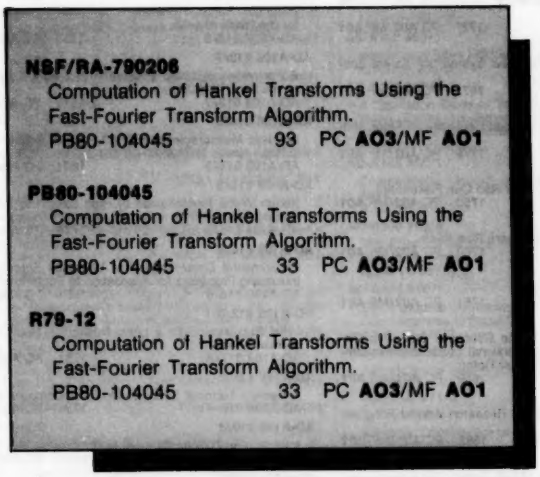
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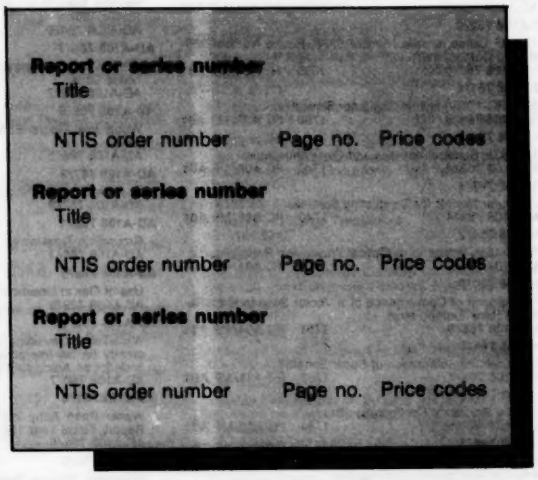
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AD-A108 962/2 1758 PC **A04**/MF **A01**

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